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France's War in Mali

Lessons for an Expeditionary Army

Michael Shurkin

Prepared for the United States Army

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Preface

This report, *France's War in Mali: Lessons for an Expeditionary Army*, presents key observations and an analysis of French Army operations in Mali in 2013 as a model for what an expeditionary, regionally aligned force might look like, one that meets a number of U.S. Army desiderata regarding tailorability, scalability at a level lower than a brigade, and light deployment and sustainment requirements. In effect, the U.S. Army arguably could not do what the French did because of a variety of differences. At the very least, those differences would have meant that the Army would have deployed a vastly larger force, with much greater sustainment requirements.

In recent years the U.S. Army's interest in developing and maintaining ready expeditionary forces has coincided with budget pressures that have generated interest in learning to do more with less. Thus, on the one hand, there are discussions regarding what an expeditionary force should look like, how it should be organized, what capabilities it should have, how it should be deployed and sustained, and so on, all within the larger context of modularity and the Army Force Generation cycle. On the other, there is an interest in being able to operate at a smaller scale and tailor force packages for specific needs. Related to both are questions pertaining to specialization versus aspiring to true full-spectrum capabilities, as well as the development of regionally aligned forces, which is tantamount to specialization. But what would that really look like? This study should be of significance to Army planners interested in shaping the future force and responding to the requirements associated with making the Army more expeditionary as well as tailorable, capable of operating effectively at smaller scales, and more regionally aligned.

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Summary

In 2013, just as U.S. Army Chief of Staff General Raymond Odierno was articulating a particular vision for expeditionary operations, the French Army was fielding a force in Mali that in many ways provided a real-world example of the kind of operations Odierno envisioned. France fielded a relatively small force put together using small, scalable combined arms task-organized units as basic building blocks and conducted a campaign that emphasized speed and maneuver over force protection. The French force, moreover, is for all intents and purposes regionally aligned, and it demonstrated the benefits that could accrue through its apparently effective operations among and with local and regional actors. The French also have a force structure well suited to expeditionary operations in austere environments, as well as an expeditionary institutional culture.

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Abbreviations

AQIM	al-Qaeda in the Islamic Maghreb
ATGM	anti-tank guided missile
EBRC	engin blindé de reconnaissance et de combat (armored reconnaissance and combat vehicle)
ECOWAS	Economic Community of West African States
FÉLIN	Fantassin à équipement et liaisons intégrés (Infantry Soldier with Integrated Equipment and Networks)
GTIA	Groupement tactique interarmes (Combined Arms Tactical Group, battalion size)
GTIA TAP	Groupement tactique interarmes—troupes aéroportés (Combined Arms Tactical Group—Airborne Troops)
HQ	headquarters
IED	improvised explosive device
ISR	intelligence, surveillance, and reconnaissance
MANPADS	man-portable air defense systems
MNLA	Mouvement national de libération de l'Azawad (National Movement for the Liberation of Azawad)
MUJAO	Mouvement pour l'unicité et le jihad en Afrique de l'ouest
MUJWA	Movement for Unity and Jihad in West Africa
PEGP	Politique d'emploi et de gestion des parcs (Fleet Use and Management Policy)
PVP	petite véhicule protégé (small protected vehicle)
RAMa	régiment d'artillerie de marine (marine artillery regiment)
RCP	régiment de chasseurs parachutistes (parachute chasseur regiment)
REC	régiment étranger de cavalerie (Foreign Legion cavalry regiment)
REP	régiment étranger de parachutistes (Foreign Legion parachute regiment)

RGP	régiment du génie parachutiste (parachute engineering regiment)
RHP	régiment de hussards parachutistes (parachute hussard regiment)
RI	régiment d'infanterie (infantry regiment)
RIMa	régiment d'infanterie de marine (marine infantry regiment)
RPG	rocket-propelled grenade
RPIMa	régiment de parachutistes d'infanterie de marine
RSC	régiment de soutien du combattant (combat support regiment)
SGTIA	sous-groupement tactique interarmes (combined arms tactical subgroup), company size.
SOF	Special Operations Foreces
VAB	véhicule de l'avant blindé (forward armored vehicle)
VBCI	véhicule blindé de combat d'infanterie (armored infantry combat vehicle)
VBL	véhicle blindé léger (light armored vehicle)
VBMR	véhicle blindé multi-rôles (multirole armored vehicle)
VLRA	véhicule léger de reconnaissance et d'appui (light reconnaissance and support vehicle)

CHAPTER ONE

Introduction

In February 2013, U.S. Army Chief of Staff General Raymond Odierno presented his vision of the future of the Army in an article in *Foreign Affairs*, along with the more official 2013 Army Strategic Planning Guidance.[1] The Army, Odierno noted, had changed significantly as a result of a decade of operations in Afghanistan and Iraq. It needed, in effect, to be recentered. The top priority was restoring the Army's conventional capabilities and retaining its value as a deterrent associated with its unique ability to deploy and sustain indefinitely large formations capable of defeating any adversary. However, in light of changes in the nature of warfare and the various threats facing the United States, technological advances, and growing fiscal pressures, the future force could not simply revert to what it was in the 1990s. On the contrary, it had to be something altogether new and different. Among other things, Odierno called on the Army to be:

- Capable of rapidly deploying scalable force packages, from the smallest to the largest, depending on the demands of the situation; the smaller packages should be capable of rapidly reassembling into larger combat formations as requirements change, and units should be capable of task organizing at increasingly lower levels to execute "small footprint" operations
- Endowed with "overmatch capability" from the squad to the brigade level,[2] thanks in part to high-tech vehicles and networking technologies that help soldiers wield the necessary combat power for independent, limited-objective operations as well as large-scale operations
- Oriented to stress small-unit leadership that thrives in an environment of dispersed, decentralized operations
- Expert in the social and political fabric of the surroundings and appreciative of the heightened importance of such expertise relative to basic ability to dominate the battlefield
- Regionally aligned, so that operating units are familiar with local cultures, personalities, and conditions.

At the same time that Odierno was presenting these ideas, the French Army was conducting a military intervention in Mali, known as Operation Serval, in which the army was demonstrating the very competencies that Odierno was calling for. The French rapidly deployed

[1] Ray Odierno, "The Force of Tomorrow," *Foreign Policy*, February 4, 2013.

[2] Raymond Odierno, "General Odierno Speech at AUSA Annual Conference, October 2012," Association of the United States Army Annual Meeting, October 23, 2012.

a relatively small force composed of smaller, company-scale combined arms units skilled in decentralized and distributed operations and in the art of re-forming and reorganizing in light of emerging tasks. These operations, moreover, were not a one-off response to a unique crisis but bespeak long experience and established practices conducting small-footprint, limited expeditionary operations. It should also be noted that whereas discussions regarding Regionally Aligned Forces remain vague with respect to what precisely the term means, how the concept should work, and what the benefits might be, the French, by virtue of their repeated rotations through former colonies, are in effect regionally aligned, and in Mali they demonstrated their ability to leverage local area knowledge by, among other things, knowing with whom to work and how. Finally, the French have been making significant investments in new vehicles and technologies intended to enhance the capabilities of their forces, down to the squad and individual soldiers, although their use in Mali appears to have been limited.

This report examines French Army operations in Mali during what can be described as the "major combat operations" phase of Operation Serval, from the beginning of the intervention in January 2013 to April of the same year. The report seeks to detail what the French did and how they did it, with an eye toward identifying important aspects of how the French go about relatively small-scale expeditionary operations. Whether the U.S. Army can or should emulate the French Army is, of course, debatable, but we wish to provoke such a debate because of our conviction that it would inform discussions regarding how to fulfill Odierno's vision and regarding precisely what is to be meant by *expeditionary* and *regionally aligned*.

Discussions of French success in Mali naturally must be tempered by a few qualifications. First, there is the basic problem of the overdetermined nature of French battlefield victories, meaning that any time French forces clash with local combatants in West Africa, it is a safe bet that they will prevail for any number of reasons (e.g., professional forces versus irregulars). Our purpose is therefore not to trumpet French victories or document how the French "beat" the enemy but to examine how the French Army operated. Second, using the term *major combat operations* in this context reminds of us of an earlier conflict, Iraq, in which a relatively conventional initial phase gave way to a very different kind of conflict that tested different capabilities. Indeed, more than a year after it started, France's military intervention is far from over, and predictably enough, the conflict arguably has evolved into a low-intensity insurgency.[3] Third, while the attributes and competencies discussed here may serve France well in Mali, their relevance for other kinds of conflicts, particularly ones greater in scale and intensity, remains an open question. Odierno, after all, insists—as do the French—that the Army should be able to conduct limited operations such as Serval *and* much larger-scale conventional operations. The evidence provided here sheds little light regarding how the French would fare in a more intense conflict. Additionally, while logistical limitations clearly make it difficult for France to mount operations much larger than Serval, it is less clear whether the French Army's approach to expeditionary warfare and the various organization aspects of French operations that are discussed here scale up. To be more precise, we argue here that the French are particularly good at subbrigade-level operations. But what about larger ones? Fourth, the French, though they pride themselves on being able to make do with limited resources, relied on their allies for help with airlift, aerial refueling, and intelligence, surveillance, and reconnaissance (ISR). According to a French Senate report on Serval, allies supplied 75 percent of the military airlift used

[3] France officially ended Serval on July 15, 2014, replacing it with a broader regional counterterrorism effort, Operation Barkhane. Barkhane's headquarters are in Chad, but its focus remains northern Mali.

for Serval and transported three-quarters of the personnel and materials during the first three weeks of the operation; allies provided 30 percent of the aerial refueling; and the United States supplied an unspecified portion of the ISR that French forces used.[4]

Our approach has been to establish an accurate narrative of Operation Serval that details what the French Army did, how, and, to some extent, why. The sources are primarily French military documents—briefings, publications, and website postings, above all from the French Ministry of Defense's site, which has provided nearly daily updates and a variety of other relevant resources.[5] We also interviewed French Army officers and drew on independent French defense-related blogs and press reporting.

The result is a decidedly *French* narrative, and an official one at that. This serves the immediate purpose of highlighting aspects of French Army operations to inform discussions about what an expeditionary force that resembles Odierno's vision might look like in the real world, and it is also of value for an American audience unfamiliar with the French Army. It is, above all, simply the most accurate and authoritative narrative possible given the sources currently available. The disadvantage is that the account presented here is one-sided. Ideally, French claims regarding what worked, for example, or their characterizations of their operations or their military culture would be tested and verified using independent information. The French sources cited in the report say that they are convinced that their fast-paced operations and rapid movements account for their success. They also stress the insufficiency of precision air strikes and the need to complement them with ground operations, and they congratulate themselves for their willingness to commit infantry to battle as well as for the conduct of that infantry. Assuming that the French sources are sincere, they may be seeing only what they want to see or things that conform with their assumptions. A more objective, balance assessment might reveal, for example, that precision strikes in fact accounted for France's success, whereas the value of the ground campaign was marginal and needlessly risky. Maybe the enemy never had the capacity to offer much resistance against any organized force, let alone one with any sophistication, so long as that force was less feckless than the Malian Army. Maybe, appearances aside, the French bungled their relations with local and regional forces. Knowing the opponents' side of the story would be particularly valuable for assessing the efficacy of particular French efforts, tactics, weapons, and so on. We look forward to conducting additional extensive research that would provide a more balanced and detailed history of Operation Serval and assessment of French Army operations. The information here at least informs the reader and establishes a point of departure for future discussions and investigations.

This report has two main chapters. The first provides an overview of the crisis in Mali that precipitated the January 2013 intervention, discusses French objectives and strategy, and then details the course of the war through April. The second is a general discussion of various aspects of French Army operations in Mali, including the French Army's ability to task organize at a small scale, its force structure, its use of regional expertise, and aspects of French military culture.

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[4] Jean-Pierre Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* Paris: Sénat, April 16, 2013, p. 20.

[5] See the French Ministry of Defense's website, www.defense.gouv.fr.

Some of the research into the context of the crisis in Mali, including interviews in Bamako with northern Malian community leaders, was conducted for separate RAND studies by the same author along with a coauthor, Stephanie Pezard.[6]

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[6] See Stephanie Pezard and Michael Shurkin, *Toward a Secure and Stable Northern Mali: Approaches to Engaging Local Actors*, Santa Monica, Calif.: RAND Corporation, RR-296-OSD, 2013.

CHAPTER TWO

Operation Serval

Background

The insurrection that broke out in January 2012 was led by a new Tuareg nationalist group, the National Movement for the Liberation of Azawad (Mouvement national de libération de l'Azawad; MNLA). Although the insurrection is often blamed on the spillover from the unrest in Libya and a new wave of returning Libyan Army veterans, the importance of the Libyan factor is probably overstated and may have only precipitated events.[1] Arms taken from Libyan depots no doubt helped the rebels, but the area was already awash in small arms, and rebel successes against Malian Army positions meant that a large portion of the weapons in the militants' hands were of Malian provenance. Many Tuaregs in the Malian Army—themselves largely veterans of previous rebel movements who had been integrated into the Malian military as part of peace accords—deserted to the MNLA and took their weapons with them. The MNLA, though boasting members from a variety of Arab, Tuareg, and other northern communities, appears to be led by members of a few noble clans from the dominant Kel Adagh tribal confederation, including those who were involved in a 2006–2009 revolt. By all accounts, most Tuaregs and other northerners did not support the rebellion. Among them was Haji ag Gamou, now a general, and his men, all members of a lower Tuareg caste than the ones involved in 2006–2009 and the MNLA. They fought against the nobles in the 1990s and were instrumental in Bamako's defeat of the 2006–2009 rebellion.[2] They remained loyal again in 2012, although Haji ag Gamou briefly defected to the MNLA and then slipped across the border into Niger with his men, where he insisted that he had only defected to save them.[3]

As the MNLA rolled up northern towns, it struck alliances with al-Qaeda in the Islamic Maghreb (AQIM) and two new largely indigenous Islamist groups. The larger of the two, Ansar Dine, was a new organization led by none other than Iyad ag Ghali—a rebel leader in the 1990s and from 2006 to 2009 who turned Islamist some time after the turn of the century—and other Tuareg aristocrats, including Alghabass ag Intallah, the son of the current

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[1] For more on the MNLA and the background to the insurrection, see Pezard and Michael, *Toward a Secure and Stable Northern Mali*. The information in the following paragraphs comes from that study, unless indicated otherwise.

[2] Discussions of the clan and tribal politics and the roles of the different clans and castes in the various conflicts of the 1910s, 1960s, 1990s, and 2006–2009 can be found in Pierre Boilley, *Les Touaregs Kel Adagh: Dépendances et révoltes—du Soudan français au Mali contemporain*, Paris: Karthala, 1999; Charles Grémont, *Tuaregs et Arabes dans les forces armées coloniales et maliennes: Une histoire en trompe-l'œil*, Note de l'Ifri, Paris: Ifri, 2010; Jean Sebastien Lecocq, "That Desert Is Our Country: Tuareg Rebellions and Competing Nationalisms in Contemporary Mali (1946–1996)," Academisch Proefschrift, Universiteit von Amsterdam, 2002.

[3] Baba Ahmed, "Mali: Comment Ag Gamou a échappé au MNLA et à Ansar Eddine," *JeuneAfrique.com*, April 11, 2012.

amenokal (traditional chief) of the Kel Adagh and grandson of the chief whose alliance with the French Army in 1903 brought about French control over northern Mali and the political hierarchy that has been contested ever since Mali became an independent state. Iyad ag Ghali had tried to assume leadership of the MNLA but was rebuffed by the movement's founders, perhaps because they were motivated by a desire to elevate their clans' positions relative to Iyad ag Ghali's more elite clan. The smaller but in some ways more dangerous of the two indigenous Islamist groups was the Movement for Unity and Jihad in West Africa (MUJWA), a Gao-based group that drew its strength from radicalized Arab, Peul (Fula), and Songhay communities. Unlike Ansar Dine, which was essentially a rebel army despite its Islamist messaging, MUJWA has more of a terrorist bent and has been associated with suicide bombings. It also has deeper roots in local communities, which suggests that it will be more difficult to eradicate. In June 2012, Ansar Dine, AQIM, and MUJWA turned on the MNLA and seized control of northern Mali from the Tuareg rebel group. By the fall of 2012, the partition of Mali had become a fact, with the Islamists and the Malian military settling into a Phony War.

The numbers of fighters associated with the Islamist groups prior to the French intervention are not known, although estimates generally gave Ansar Dine and AQIM a few thousand fighters each, and MUJWA perhaps under 1,000 (see Figure 2.1). (A French Army briefing from June 2013 estimates the total number to have been only 1,500, although we do not know if that number reflects post–January 11 intelligence or the French estimate of the threat prior to the intervention.[4]) All three, moreover, appear to have been well funded from a variety of sources. Among the known sources of money are the drug trade and multimillion-euro ransoms paid by European governments and family members in exchange for European tourists taken hostage. Beyond that, Algeria is alleged to have provided money to Ansar Dine, and there are allegations tying Qatar and Qatari nongovernmental organizations to MUJWA, although no evidence is available.[5] The money was evident in the groups' ability to field relatively large formations and transport them using large numbers of Toyota vehicles. They also used the money to undermine the MNLA, essentially by offering more money to fighters and by providing some services, as well as—in the case of MUJWA—promising money for the families of the fallen. As for the militants' weaponry, throughout 2011 and 2012 there were press accounts alleging that AQIM and the Tuaregs who formed some of the ranks of the MNLA possessed heavy weapons and possibly precision weapons, including man-portable air defense systems (MANPADS) and anti-tank guided missiles (ATGMs), looted from Libyan arsenals.[6] Mali's soon-to-be-deposed president, Amadou Toumani Touré, for example, told a French journalist in March 2012 that MNLA fighters had taken out of Libya and into Mali light armored vehicles, artillery, antiaircraft cannons, and SAM-7 MANPADS.[7]

France had no forces in Mali on January 10, but it had military assets close at hand. According to a report by the French Senate, there were 250 soldiers in Dakar, Senegal; 950 troops and Mirage 2000D fighter jets based in Ndjamena, Chad; and 450 soldiers in Côte

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4 Bruno Helluy, "11th Parachute Brigade Presentation," PowerPoint, Ft. Bragg, June 23, 2013.

5 For a discussion of these allegations, see Khalid Lum, "RE: Canard Enchaîné, Qatar in Northern Mali and Algeria," *The Moor Next Door*, June 10, 2012.

6 For example, "Des armes lourdes récupérées par Aqmi en Libye," *Rfi.fr*, March 28, 2011.

7 Thierry Oberlé, "'AQMI épaule les rebelles touaregs': Interview: Amadou Toumani Touré, le président malien, s'exprime pour la première fois dans un média étranger depuis le début de la rébellion touarègue," *LeFigaro.fr*, March 14, 2012.

Figure 2.1
Mali on the Eve of Operation Serval

SOURCE: Map shared by Orionist via Wikipedia; CC BY SA 3.0.
NOTE: MUJAO = Mouvement pour l'unicité et le jihad en Afrique de l'ouest, the French version of MUJWA.
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d'Ivoire.[8] Finally, a Special Operations Forces (SOF) contingent possibly numbering as many as 400, with ISR and helicopters, was in the region as part of a counterterrorism operation known as Operation Sabre, based in Ouagadougou, Burkina Faso.[9]

The Phony War and de facto partition of Mali between the Islamists in the north and the Malian government in the south ended on January 10, 2013, when Islamist columns struck Konna, putting them 48 hours away from Bamako. France responded within a matter of hours by redirecting the Operation Sabre assets to do what they could to stop the Islamist offensive and, in effect, pushing the button that set in motion the French military's emergency-alert system and focused France's military resources around the Herculean task of getting forces to the fight and sustaining them.

Why France Went to War

Prior to the Islamist offensive on January 10, French policy was to avoid unilateral intervention and instead work through international organizations such as the United Nations and the European Community of West African States (ECOWAS) to assemble a multinational force that would enter northern Mali. According to Colonel Frédéric Garnier, who served in

[8] Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 19.

[9] Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 18.

the General Staff during the planning phase of Serval, France had no specific contingency plan for a military intervention at that time, although a French military publication states that planning for a contingency in the region had taken place in 2009–2010, and related training exercises took place in 2011 and 2012.[10] On January 10, however, the French assessed that they could no longer wait for an international force and needed to go to war, immediately.

Paris's sense of urgency stemmed from a number of factors. First, the French believed that the invading Islamists were aiming for Bamako, which was within easy reach and in effect lay before them, an open city. Although not explicitly referenced by the French sources used for this study, a current draft of a new French Army field manual on desert operations makes it clear that the French are familiar with indigenous tactics in the region and have a great deal of respect for the speed and offensive capability of a *rezzou*, a long-distance raid by columns of Toyota-mounted fighters armed with machine guns and rocket-propelled grenades (RPGs), against poorly prepared defenders.[11] Only direct French intervention had a good chance of stopping the attack.

Of course, France had stood by while *rezzous* wreaked havoc on other Sahelian cities, most notably Ndjamena, Chad, but this time the French were not willing to hold back. Setting aside the argument that President François Hollande wanted to shore up his flagging popularity through decisive French military action, one of the most often cited reasons is the threat posed by the Islamists—who were in the business of taking Western hostages for ransom—to the more than 6,000 French and 1,000 other Europeans in Mali, far more than France was capable of evacuating.[12] And then was concern for Malians themselves: "Without the intervention of the French Army, it is an entire country that would have been delivered to hostage takers."[13] The French also believed that the fall of Mali to the Islamists would destabilize the entire region and significantly elevate the terrorist threat to France itself.[14]

It follows that France's objectives, as announced by Hollande on January 11, were threefold:

1. Stop the terrorist aggression.
2. Secure a country in which there are many thousand French people.
3. Permit Mali to recover its territorial integrity.

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[10] Interview with Colonel Frédéric Garnier, October 2, 2013; *Opération Serval: Le retour de la manœuvre aéroterrestre dans la profondeur*, Réflexions Tactiques, Numéro Spécial, Paris: Armée de terre, Centre de doctrine d'emploi des forces, 2014, p. 8.

[11] *Doctrine d'emploi des forces terrestres en zones desertique et semi-desertique (edition provisoire)*, Centre de doctrine et d'emploi des forces, 2013, pp. 101–104.

[12] Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 9. This and all other translations are the author's own. The report notes that these numbers represent only those French and other Europeans who were registered with the French and other embassies, meaning that the actual numbers of European citizens in Mali probably was significantly larger.

[13] Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 9.

[14] Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 10.

There was also an unspoken fourth goal, according to a French Senate report, which was freeing five French and three other hostages (one Dutch, one Swedish, and one South African) in AQIM custody.[15] One of the French hostages was executed after Serval began.

Strategy

According to Garnier, the French strategy initially went no further than blocking the Islamist drive south, and French planners retained some hope that they might be able to stick to the original, pre–January 10 policy of waiting for the Malians and the emerging multinational intervention force to get on their feet and, in good time, move north. A precedent was Operation Manta in 1983–1984, when France drew a line in Chad, beyond which a rebel army and its Libyan backers could not go, before helping the Chadians to move north of the line and expel the Libyans. French leaders abandoned this option, according to Garnier, when a rebel attack on January 14 convinced planners that France had to expand its military objectives to seizing the north without waiting for help.[16]

In any event, the strategy that quickly crystalized had two basic pillars. One was simply to move as fast as possible, both to save Bamako and also to pursue France's other military objectives as they developed. A reason for this, according to Colonel Bruno Helluy, one of Serval's planners, is that Hollande was urging the army to "get it done" as fast as possible.[17] Another reason was the initial French intelligence assessment that the enemy in Mali would not stand and fight, meaning that French forces would have to move as quickly as possible if they wanted to destroy the enemy before it successfully scattered or slipped out of reach.[18] Helluy argues that France not only achieved strategic surprise by attacking in the first place but also maintained it by consistently acting faster and with greater "audacity" than the Islamists expected. This meant deploying a relatively small and light force and moving it at a pace that strained men and machines alike and pushed the limits of France's logistical and sustainment capabilities. The risk was significant. One of France's leading military analysts, Colonel Michel Goya, who is currently serving in the French Army's "lessons learned" center, noted that the column assembled to capture Timbuktu might have come to grief against a more determined and better organized enemy because of the various problems resulting from the haste with which it was cobbled together and pushed toward its objectives.[19] For Helluy and other planners, the associated risk was acceptable.

Helluy's use of the term *audacity* suggests the relevance of French military culture. Goya argues in fact that the term is rooted in aristocratic values and the ethos of the old horse cavalry. According to Goya, whereas the old Royal Army consisted of sappers and artillerymen who favored systematic, rational approaches to operations, the aristocrats in the cavalry cultivated a strong preference for "audacious," bold, and dramatic movements.[20] Napoleon, both

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[15] Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 13.

[16] Interview with Colonel Frédéric Garnier, October 2, 2013.

[17] Helluy, "11th Parachute Brigade Presentation."

[18] "L'engagement des forces prépositionnées en Afrique: D'Abidjan à Tombouctou et Gao: Le raid blindé du 4e escadron du 1er RHP," *Béret Rouge: Le Magazine des Parachutistes*, May 2013, p. 10; Helluy, "11th Parachute Brigade Presentation."

[19] Interview with Colonal Michel Goya, October 3, 2013.

[20] Interview with Colonal Michel Goya, October 3, 2013.

an aristocrat and an artillery officer by training, took up the idea and promoted it further. "In war," he once said, "audacity is the most beautiful calculation of the engineer."[21] Audacity, Goya observes, still remains highly valued within French combat arms as an operational ideal. French desert warfare doctrine also stresses the importance of mobility and bold, rapid movements intended to preserve "tactical initiative" while discouraging static positions.[22] One should, in effect, move as fast as one's vehicles and the need for discretion permit.[23]

Whatever the origins of the term, it seems that French commanders welcomed the opportunity to conduct a campaign that suited their vision of how a campaign should be fought, a vision that resembles contemporary *manoeuvrist* doctrine. Evidence can be seen in the decision of the future Serval commander General Bernard Barrera, when he became the commander of the 3rd Mechanized Brigade (3e Brigade mécanisée) in 2011, to train his units to fight differently from the way they had fought in Afghanistan. According to Barrera, "the type of warfare conducted [in Afghanistan] was not the ultimate model for military action."[24] In other words, that was not the proper way to fight. The better way was "offensive action conducted with long lines to destroy the enemy." That, he said, was how he trained his men and then how he deployed them once deployed to Mali. Mali offered a chance to go back to fighting the "right way." Thus, the French trumpeted the "return of Airland Maneuver in the Depth [*sic*]" (see Figure 2.2).

Related to this is the guidance given to the military by Hollande, who early on expressed an interest in using airborne troops to help maintain an aggressive tempo.[25] According to Barrera, when he met Hollande at Timbuktu, the president instructed him to "destroy those in front of you and go fast."[26] For Barrera, this was a welcome break after conducting so many stabilization operations: This time, he was under orders to win, which enabled him to act as dynamically as he could have desired. As he told a reporter:

> I wanted an offensive maneuver while sending a maximum number of troops north. Audacity, the taking of the initiative, joint and combined arms maneuver, the integration of everything to attain "one sole goal, Victory,"—as our motto and emblem say.[27]

In any case, the French did not want to give the enemy the opportunity to get back on its feet, and they insist that their audacity and speed kept the enemy from organizing defenses, with the one notable exception of the Adrar des Ifoghas mountains, especially the Amettetaï valley, discussed later. To cite General Grégoire de Saint Quentin, who commanded Serval during the first half of the year, "the first factor of success for Operation Serval was [France's]

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[21] "À la guerre, l'audace est le plus beau calcul du génie." Napoleon may have been making a pun, since *génie* refers both to "genius" and "engineering."

[22] *Doctrine d'emploi des forces terrestres en zones desertique et semi-desertique (edition provisoire)*, pp. 29, 33.

[23] *Doctrine d'emploi des forces terrestres en zones desertique et semi-desertique (edition provisoire)*, p. 29.

[24] Jean-Dominique Merchet, "Général Barrera: 'Mes ordres étaient clairs: détruisez les djihadistes!'" *L'Opinion*, July 13, 2013.

[25] Helluy, "11th Parachute Brigade Presentation."

[26] Merchet, "Général Barrera."

[27] Merchet, "Général Barrera."

Figure 2.2
Slide from a French Army Briefing on Operation Serval

SOURCE: Philippe Roux, "RAND Corporation Conference: French Army Update Sahel Operation 'Serval' Lessons Identified," PowerPoint, RAND Corporation, Alexandria, Va., October 23, 2013.

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ability to take and keep the initiative."[28] Regrettably, without knowledge of the Islamists' side of the campaign and their efforts to respond to French moves, it is impossible to validate the French commanders' claims. Was it French audacity that prevented the Islamists from mounting effective defenses, or did they simply lack the capacity to absorb hard blows? A number of plausible alternative explanations for the ineffectiveness of the Islamists once the French attacked can be imagined.

The second pillar of French strategy was the assumption that the fight would have to be conducted by ground forces, although within a combined arms and joint framework, as per French doctrine. To some extent the use of light infantry was circumstantial—the forward-deployed units that were the first to enter the fight happened to be light infantry, and it took more time to bring heavier mechanized infantry into theater. Nonetheless, the emphasis on infantry and ground operations reflects the conviction that however useful and essential stand-off strike may be, one has to be on the ground to close with the enemy, capture territory, and control it. Goya, in a television interview given on January 15, 2013, was asked by the journalist if the perceived switch from an air campaign to a ground war meant that the French campaign was having more difficulty than expected. Goya explained that he was confident that this was the plan all along: Sound military strategy required deploying strike and ground forces as complementary elements. Ground troops, moreover, are required to conquer land,

[28] Grégoire de Saint Quentin, "Premières leçons opératives de l'opération Serval (janvier–juin 2013)," *Revue Défense Nationale*, no. 763, October 2013, p. 32.

and ground troops were also necessary to minimize collateral damage, since airstrikes were primarily useful for relatively fixed and readily identifiable targets but could do little against an enemy that was dispersed among the population. There was a risk associated with ground troops, Goya noted, but the risk had to be run.[29]

The importance of closing with the enemy on the ground is a frequent theme in the writings of another of France's leading military theorists, the retired general Vincent Desportes. Setting aside high-intensity conflicts against peer states, in which, according to Desportes, high technology and firepower are essential, Desportes believes that in most conflicts today and in the foreseeable future, neither raw destructive power nor high technology is of much value compared with having a ground presence. The point, he told the French Senate, is not to destroy but to control the ground, and one cannot do that if one is not there: "If you want to control, you have to be present in force in the physical environment in which crises are born, grow, and resolved, that is to say, on the ground." He added: "Ask our American and Israeli friends, they know something about this."[30] In his book, *La guerre probable* (*The Probable War*), in which he speculates about the future of warfare, Desportes rejects the idea that technology can compensate for "boots on the ground" and argues that contemporary as well as future "probable" conflicts require a ground presence more than ever:

> Contact on the ground, over the longer term, affirms itself as an essential argument, and combat, always combined arms at the lowest level, at short distances and even close quarters, comes back in force. On the contrary, the pertinence of standoff—combat at a safe distance—declines. The dream of "fire and forget" dissolves before the absolute necessity of occupying newly secured space, meter by meter.[31]

Obviously, a ground-forces commander can be relied on to advocate the use of ground forces; however, Serval's planners appear to have shared his convictions, and the French in Mali made extensive use of mechanized and dismounted infantry notwithstanding the extensive use of precision fires provided by French fighter jets. The concept of operations for Serval featured three phases:

1. *Seize terrain*.
2. *Search and destroy the enemy*.
3. *Stabilization*—ideally in concert with Malian and other allied forces (UN, ECOWAS).[32]

All the while, French forces would strive to locate French and other Western hostages held by AQIM.[33] Primary responsibility for finding the hostages, however, appears to have fallen on the French intelligence service and not the army.

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[29] "Mali: Le colonel Michel Goya décrypte la stratégie de la France," video, posted by TV5MONDE, January 15, 2013.

[30] Vincent Desportes, "Forces terrestres et nouvelle conflictualité," *Doctrine: Revue D'études Générales*, no. 13, 2007, p. 6.

[31] Vincent Desportes, *La guerre probable*, 2nd ed., Paris: Economica, 2008, p. 67.

[32] Helluy, "11th Parachute Brigade Presentation."

[33] Helluy, "11th Parachute Brigade Presentation."

Into the Breach

On January 11, five hours after Hollande announced the beginning of Serval, according to the Senate report, SOF Gazelle helicopters deployed to Sabre and based in Burkina Faso, along with SOF ground elements, began attacking Islamist columns while SOF ground elements began scouting and attempting to organize and rally Malian defenses. One Gazelle pilot was killed by ground fire. French SOF would continue to play a critical role in Serval, and close SOF and conventional force integration has been cited as an important ingredient in the French Army's success in Mali.

As France committed its nearby SOF assets, it also began to stream conventional forces into theater. The first were units already present in the region either as part of ongoing operations (in Chad and Côte d'Ivoire) or forward deployed (Gabon). These provided a quick first wave, and multiple French Army documents as well as a 2013 white paper since have stressed that prepositioning and forward-deploying forces and equipment proved their worth in Serval;[34] meanwhile, France-based troops that were part of the Guépard (Cheetah) ready pool were mobilized and deployed.

The first conventional force to reach Mali was a 200-man-strong combined arms tactical subgroup (*sous-groupement tactique interarmes*; SGTIA) (see the discussion that follows), which arrived on January 11 from Chad via C-130s and C-160s. A SGTIA is the basic building block of the French ground forces and consists of, at its most basic form, three infantry or armor platoons and one platoon from the other arm (i.e., three infantry and one armor, or vice versa), with some associated support elements and a company-level command capability, all led by two captains, one with a fires coordination responsibility (see discussion that follows).[35] More platoons and support elements can be added as required, with the limit being eight platoons total. On a larger scale, there is the combined arms tactical group (*groupement tactique interarmes*; GTIA), which has the same structure as the SGTIA, only its component parts are companies, not platoons. Thus, the basic GTIA has three infantry companies and one armor company (or three armor and one infantry), a variety of support elements, and a battalion-level headquarters capability.[36] More can be added as needed. Both GTIA and SGTIA are, by definition, scalable, and both are purpose-built for specific tasks. Finally, the French do not adhere strictly to the textbook doctrine: GTIAs and SGTIAs in Mali and now in the Central African Republic are not consistently built around the 3/1 model.

The Chadian SGTIA primarily consisted of two companies of the 21st Marine Infantry Regiment (21e Régiment d'infanterie de marine; RIMa) operating armored personnel carriers (the armored forward vehicle [*véhicule de l'avant blindé*; VAB]); a squadron from the 1st Foreign Legion Cavalry Regiment (1er Régiment étranger de cavalerie; REC) operating AMX-10RC light tanks; and a battery of howitzers and mortars from the 3rd Marine Artillery Regiment (3e Régiment d'artillerie de marine; RAMa).[37] French commanders in N'Djamena dispatched the SGTIA with only minimal supplies and organized resupply only after the troops arrived in

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[34] *Le livre blanc sur la défense et la sécurité nationale*, Paris: Direction de l'information légale et administrative, 2013, pp. 82–83, 136.

[35] *Manuel du sous-groupement tactique interarmes*, Centre de doctrine d'emploi des forces, 2009, pp. 4–5.

[36] *Manuel d'emploi du groupement tactique interarmes à dominante infanterie*, Armée de terre, 2001, p. 15.

[37] *Opération Serval*, p. 4.

Bamako.[38] On the 12th, French fighters based in Chad began striking ground targets, and a Guépard company of infantry arrived from France to join the SGTIA 21st RIMa. Meanwhile, a second SGTIA departed Abidjan for Bamako by road.

The Abidjan-based paratroopers had been present in Côte d'Ivoire since October 2012, where they were participating in Operation Licorne. On January 11 at 15:00, the 4th Squadron of the 1st Parachute Hussar Regiment (1ere Régiment de hussards parachutistes; RHP) was put on alert and told that it would depart the next morning at 07:00 for the three-day drive to Bamako. Within a few hours, an SGTIA formed around the unit, which soon included a scout platoon, two armored platoons mounted on ERC 90 light tanks, and a support platoon from the 3rd Marine Infantry Parachute Regiment (3e Régiment de parachutistes d'infanterie de marine; RPIMa). The 3rd RPIMa was in Gabon covering for a unit forward deployed to Gabon, which at the time was busy dealing with a crisis in the Central African Republic. The 3rd RPIMa had to be flown back to Abidjan in the middle of the night.[39] Also joining the SGTIA was a platoon from the 17th Parachute Engineering Regiment (17e Régiment du génie parachutiste; RGP) and a tactical command post. Altogether, the SGTIA had five maneuver elements plus logistics elements and enough supplies to last ten days.[40] It counted 200 soldiers and 60 vehicles (ERC 90s, VABs, and light armored vehicles [*véhicles blindé léger*; VBLs], among others).[41] The SGTIA reportedly was ready to go 12 hours after it was given its orders.[42]

The convoy left on January 12 at 08:00 and took two days to reach the Malian border. Transporters carried the ERC 90s as far as the Malian border; from that point on, the ERC 90s, along with the other armored vehicles, moved on their own power.[43] When they reached Bamako—1,300 kilometers later—they joined the troops dispatched from Chad and the Guépard forces that had already arrived from France, all of whom were reorganized and integrated into what became known as GTIA 1, centered around the 21st RIMa.[44]

Each day from January 12 on brought hundreds more troops, with a rhythm that quickened as more and more airlift, much of it provided by France's allies, came on line (see Figure 2.3). Most of the newcomers were Guépard. One of the largest single Guépard contingents to arrive in Mali was a complete GTIA built around two companies of the 92nd Infantry Regiment (92e Régiment d'infanterie; RI) and its state-of-the-art armored infantry combat vehicle (*véhicle blindé de combat d'infanterie*; VBCI). The GTIA, which became known as GTIA 2 or the 92nd RI GTIA, drove to Mali from Dakar, Senegal, where it had disembarked from the amphibious assault ship *Dixmude*, which had transported it from Toulon. The *Dixmude* departed France on January 21 and arrived at Dakar on January 28. The GTIA

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38 Céline Brunetaud, "La chaîne soutien en opérations: À coups d'expédition," *Terre Info Magazine*, May 2013.

39 "L'engagement des forces prépositionnées en Afrique," p. 7.

40 "L'engagement des forces prépositionnées en Afrique," p. 7.

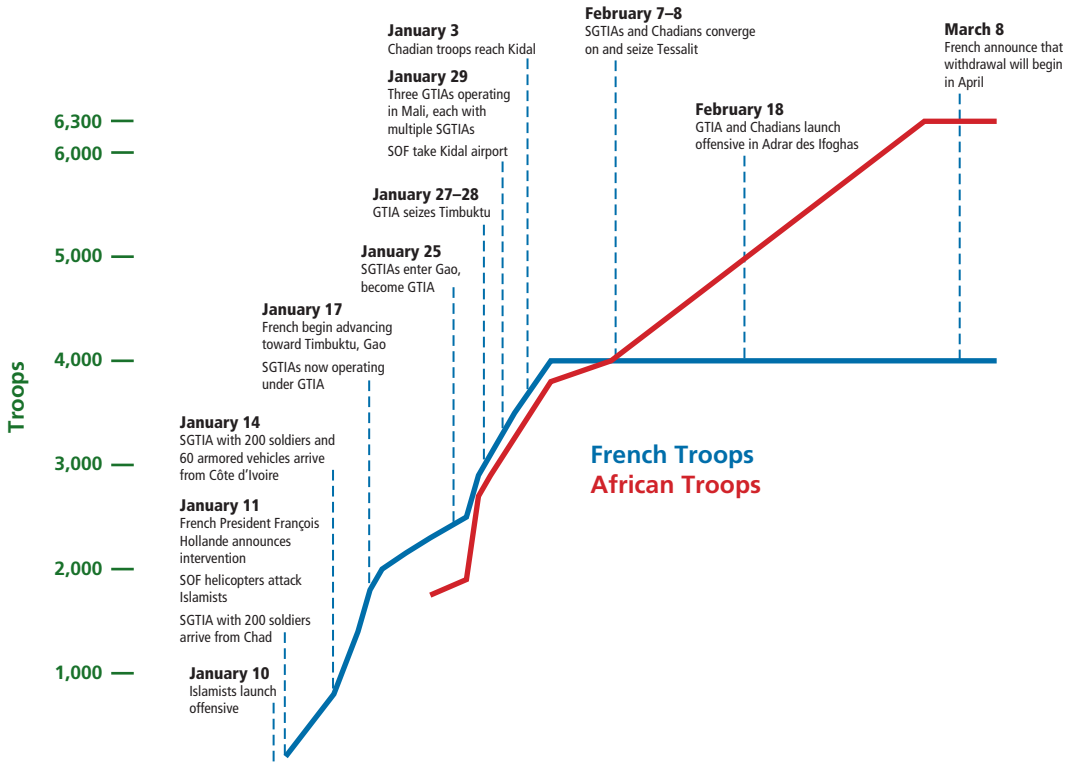
41 "L'engagement des forces prépositionnées en Afrique," p. 5.

42 "L'engagement des forces prépositionnées en Afrique," p. 5.

43 "L'engagement des forces prépositionnées en Afrique," p. 5.

44 "L'engagement des forces prépositionnées en Afrique," p. 5.

Figure 2.3
Key Events and Troop Levels



SOURCES: Compiled from regular updates posted on the French Ministry of Defense website. The numbers probably do not include SOF.

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reached Bamako on February 12, and some elements began making their way to Gao the next day.[45]

At roughly the same time that the shipborne 92nd RI GTIA was making its way to Senegal, France dispatched airborne Guépard units to Abidjan, Côte d'Ivoire, where they established a provisional headquarters for airborne operations. These forces included elements of the 2nd Foreign Legion Parachute Regiment (2e Régiment étranger de parachutistes; REP), which is part of France's rapid response force within the larger Guépard pool, meaning that it is maintained at a readiness level sufficient for it to be able to deploy within 24 hours of receiving an alert.[46] Another contributing unit was the 17th RGP. According to French military sources, the Guépard airborne units were sent to Abidjan rather than Bamako to avoid adding

[45] "Le Dixmude achemine une importante force blindée au Mali," *Mer et Marine: Tout L'actualité Maritime*, January 23, 2013; *Opération Serval au Mali: Embarquement des blindés du 92e RI à bord du BPC Dixmude*, Marine Nationale, January 22, 2012.

[46] "Opération Serval—Abidjan le 24 janvier 2013: Préparation du GTIA aéroporté," video, posted by FORCESFRANCAISES, January 19, 2013; Jean-Paul Lottier, "200 légionnaires du 2e REP de Calvi au Mali," *Corse Net Infos*, January 27, 2013.

an additional load on operations in Bamako, while also strengthening operational security for planned airborne operations.[47] The 2nd REP left its base in Corsica for Abidjan on January 23.

All the while, France was primarily responsible for bringing in growing numbers of allied African forces, the largest and most important contingent being the Chadians. The French deployment topped out at 4,000, while the combined African forces reached 6,400—2,300 of which were Chadians. See Table 2.1 for the order of battle.

Seizing Territory: The Niger Bend

On January 15 France went on the offensive and began moving north, first to secure the south and subsequently to seize control over the Niger Bend and its two cities, Timbuktu and Gao, which are by far the largest towns in northern Mali. Taken together with the larger administrative regions, Timbuktu and Gao host 94.8 percent of northern Mali's population, according to the 2009 census.[48]

First a SGTIA with 30 armored vehicles secured the bridge at Markala, and then the rest of the GTIA pushed over the bridge and divided into two forces, one tasked with taking Timbuktu via Diabaly, Nampala, Léré, and so on, and the other aiming for Gao. All the while, French SOF surged ahead, and French jets and helicopters—Tiger and Cougar helicopters arrived in theater on January 17 via a Canadian C-17—flew countless reconnaissance, interdiction, and close air support sorties. France also deployed a variety of ISR assets, including its Harfang drone, which flew its first mission in Mali on January 18.[49]

The French force that advanced toward Timbuktu consisted of a 600-strong element made up of mechanized infantry (the 2nd and 21st RIMas, using VABs). They do not appear to have met much resistance on their way up. The force left Niono on January 18, retook Diabaly on the 21st, and finally reached the Timbuktu airport on January 27–28, after stopping to secure Nampala and Léré, as well as making frequent stops to rescue vehicles that got stuck in sand. Before the column reached the airport, roughly 250 members of the 2nd REP staging out of Abidjan conducted a night parachute landing to occupy exit routes out of the city with the intention of blocking fleeing militants. (They encountered none.[50]) Ten members of the 17th RGP, with their construction equipment and also staging out of Abidjan, parachuted into Timbuktu on January 29 to clear the airport for operations.[51]

The column tasked with taking Gao reached Douentza on January 21 and Hombori on the 25th. On the 24th or 25th, Islamist militants destroyed the bridge at Tassiga, but it is not clear whether it slowed the French advance: French SOF seized the Gao airport and a bridge at Wabaria on the 25th, and conventional forces moved on the city that same day. It should be noted that many of the men and vehicles that reached Timbuktu were the same that had

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47 Roux, "RAND Corporation Conference."

48 *4ème recensement general de la population et de l'habitat du Mali (RGPH)*, Republique du Mali, Ministère de l'economie et des finances, Institut national de la statistique, and Bureau central du recensement, November 2011.

49 "Operation Serval: Zoom sur le détachement Harfang," Ministère de la défense, August 2, 2013.

50 Helluy, "11th Parachute Brigade Presentation."

51 "Serval: Rétablissement de la zone aéroportuaire de Tombouctou et de Tessalit," *Béret Rouge: Le Magazine des Parachutistes*, May 2013.

Table 2.1
Operation Serval Order of Battle, as of April 2013

Regiment	Brigade	Type	Contingent Size	Main Vehicle or Weapon System Used in Serval	Provenance
	3e Brigade mécanisée	Brigade HQ			
	11e Parabde	Brigade airborne ops HQ			
1e Régiment etranger de cavalerie	6e Brigade légère blindée	Light armor	One platoon	AMX-10RC	Chad
21e Régiment d'onfanterie de marine	6e Brigade légère blindée	Mechanized infantry	Two companies	VAB	Chad
3e Régiment artillery de marine	6e Brigade légère blindée	Artillery	One platoon	120-mm mortars	Chad
1 Régiment de hussards parachististes	11e Brigade parachutiste	Airborne light armor		ERC 90	Côte d'Ivoire
1 Régiment de chasseurs parachutistes	11e Brigade parachutiste	Airborne infantry	Two companies		France
2e Régiment etranger parachutiste	11e Brigade parachutiste	Airborne infantry (Foreign Legion)	Airborne GTIA HQ, two companies		France
3e Régiment parachutiste d'infanterie de marine	11e Brigade parachutiste	Airborne infantry	One tactical command post, ad hoc command, support and protection unit (around 100 men)		Côte d'Ivoire
17e Régiment du génie parachutiste	11e Brigade parachutiste	Airborne engineers	One platoon		Côte d'Ivoire
1e Regiment du train parachutiste	11e Brigade parachutiste	Airborne transportation	One platoon		Côte d'Ivoire
Régiment d'infanterie chars de marine	9e Brigade légère blindée de marine	Light armor	One squadron	AMX-10RC	France
2e Régiment d'infanterie de marine	9e Brigade légère blindée de marine	Mechanized infantry	Two infantry companies, one combat service support company	VAB	France
3e Régiment d'infanterie de marine	9e Brigade légère blindée de marine	Mechanized infantry	One company		France

Table 2.1—Continued

Regiment	Brigade	Type	Contingent Size	Main Vehicle or Weapon System Used in Serval	Provenance
11e Régiment d'artillerie de marine	9e Brigade légère blindée de marine	Artillery	One platoon	CAESAR	France
6e Régiment de génie	9e Brigade légère blindée de marine	Engineering	One company	VAB	France
3e Compagnie de commandement et de transmissions	3e Brigade mécanisée	Command and signals	One company		France
1e Régiment d'infanterie de marine	3e Brigade mécanisée	Light armored	One reconnaissance squadron, one armored squadron	AMX-10RC	France
92e Régiment d'infanterie	3e Brigade mécanisée	Mechanized infantry	Three companies	VBCI	France
126th Régiment d'infanterie	3e Brigade mécanisée	Mechanized infantry	One company	VAB	France
68th Régiment d'artillerie d'Afrique	3e Brigade mécanisée	Artillery	Artillery command post, one platoon	CAESAR	France
31e Régiment de génie	3e Brigade mécanisée	Engineering	One platoon	VAB	France
5e Régiment d'hélicoptères de combat	Commandement des forces terrestres	Attack aviation		Tiger, Puma, Gazelle	France
7e Régiment du matériel	Service de maintenance industrielle terrestre	Alpine technical support	One company		France
28e Régiment de transmissions	Brigade de transmissions et d'appui au commandement	Signals	One company		France
511e Régiment du train	1re Brigade logistique	Transportation	One company		France
515e Régiment du train	1re Brigade logistique	Transportation	One company		
Régiment médical	1re Brigade logistique	Medical	7th and 9th Field Hospitals		France
Service des essenses des armées		Fuel	116 men		France

Table 2.1—Continued

Regiment	Brigade	Type	Contingent Size	Main Vehicle or Weapon System Used in Serval	Provenance
4e Régiment d'hélicoptères des Forces Spéciales	Brigade des forces spéciales terre			Tiger, Cougar Gazelle	France, Niger, Burkina Faso

SOURCE: Compiled from the Serval archives on the French Ministry of Defense's website; see "Actualité," Ministère de la défense, various dates, http://www.defense.gouv.fr/operations/barkhane/archives-serval/actualite.

driven up from Abidjan. They had spent five days in Bamako resting and conducting repairs before departing. Part of that same original Abidjan-based SGTIA was sent instead to Gao. They first traveled to Sévaré via C-130s, spent several days there, and then proceeded to Gao. They were later ordered to drive back south to Markala to take over control of that town from the MNLA.[52]

Mobilizing Local and Regional Reinforcements

France reinforced its assets in Gao with Chadian and Nigerien troops that it brought in by air (also on the 25th), as well as an allied force consisting of Malian Tuaregs. This marks the beginning of an important aspect of French operations in the Gao region: the prominent role played by France's local and regional African allies. On January 28, for example, Chadian and Nigerien forces moving overland from Niger seized control of Andéramboukane and Ménaka on their way to reinforce Gao. They were joined by a contingent of what are normally described in press and French Army reports as "Malian soldiers," but it must be made clear that they were in fact Malian Tuaregs under the command of then-Colonel Haji ag Gamou (who has since been promoted to general) and should be regarded as his militia.[53] (See Figure 2.4.) France had brought them back into Mali from Niger, where they had sidelined by the MNLA in 2012. They all, moreover, reportedly hail from the same Tuareg communities that historically had been dominated by the elite clans of the Kel Adagh confederation, the Ifoghas, and under Gamou's leadership had fought against Ifogha militias in the 1990s and from 2006 to 2009. The French also worked with another Tuareg faction, the MNLA,[54] whose fortunes apparently had improved thanks to French support. That said, the extent of French-MNLA cooperation and mutual support remains unclear. One of the few known instances is when France conducted air strikes in February 2013, apparently to support the MNLA during a clash between it and the Arab Movement of Azawad militia.[55]

The Tuareg contingents involved in French operations were small, but they played important roles as guides, scouts, and interpreters. Their contributions were particularly important for what came next, the French and Chadian advance on the Kel Adagh heartland. Their

[52] "L'engagement des forces prépositionnées en Afrique," p. 6.

[53] Rémi Carayol, "Mali: Gamou, La Revanche Dans La Peau," *JeuneAfrique.com*, March 4, 2013; "Les Touaregs Du Col. Ag Gamou et L'armée Française Aux Portes de Tessalit," video, posted by ImazighenLibya, February 9, 2013.

[54] Idnan are nobles who are generally considered Ifogha, yet they are peripheral to most of the Ifogha clans.

[55] "Des avions français bombardent le Mouvement arabe de l'Azawad," *Le Monde.fr*, May 20, 2013.

Figure 2.4
Tuareg Military Leader General Haji ag Gamou (sitting far right) Meeting with Serval Commanders in Gao, May 2013

SOURCE: "Serval: Relève de la 3e brigade mécanisée par la 6e brigade légère blindée," Ministère de la défense, May 13, 2013.
RAND *RR770-2.4*

involvement may have helped secure for France local buy-in and popular support. The MNLA and Gamou's militia all represent rival Kel Adagh factions, but they represent several factions, and thus having them on board no doubt helps. Moreover, given the racial tensions in Mali, having "white" northerners (Tuaregs) fighting alongside the French, among them Tuareg rebels, underscores France's status as a relatively benevolent third party, as opposed to simply an ally of the government in Bamako. Otherwise, the French risked mobilizing northerners against them—and possibly in favor of the Islamist militants. The French Army's colonial past in this case probably helps, given that their image in the north is generally positive, at least when compared with that of the Malian state.

The French Army's coordination with Malian Tuareg factions indicates that it has a good understanding of precisely who they are, the benefits and risks of working with them, and how far they can trust them. For example, one French Army briefing slide speaks of the "indirect" "management of [the] MNLA." It describes the MNLA as an "opportunistic ally" and queries attitudes toward them in the reconquered areas, especially given the accusations of abuses by them.[56] Another briefing warns of the "permanent risk of being used."[57] Indeed, the French officers consulted for this study have expressed discomfort regarding the problems associated with France's relations with the MNLA. From the perspective of this study, however, what matters is that the French appear sensitive to the political ramifications of engaging with the

[56] Helluy, "11th Parachute Brigade Presentation."

[57] "Briefing Land Forces May 2013," Land Forces Command, 2013.

MNLA. They also almost certainly understand tensions between Gamou and the MNLA as well as other Tuareg factions, given the general's own history and the particular communities he represents, which have repeatedly fought against the communities associated with the MNLA in 2006–2009 and in the 1991–1996 conflict in Mali. For example, Gamou's presence in Kidal in July 2013 reportedly raised the ire of the MNLA and the High Counsel for the Unity of Azawad; both are associated with clans against which the communities associated with Gamou have clashed, obliging French troops to step between the two sides.[58]

The Kel Adagh Heartland: Kidal, Tessalit, and the Adrar des Ifoghas

On January 29 French-led forces began moving north to Kidal—the epicenter of Tuareg militancy since the first Tuareg rebellion against Mali in 1963 and the seat of the Kel Adagh confederation, which has dominated northern Mali since the Ifoghas' military alliance with France in the beginning of the 20th century. On the night of January 29–30, French SOF seized the Kidal airport in a helicopter assault. On the 31st, the Malians announced that a reconnaissance unit of their army had joined the SOF at the Kidal airport. These were in fact Gamou's men. Other French units arrived to reinforce the SOF, specifically two sections of the 1st Parachute Chasseur Regiment (1er Régiment de chasseurs parachutistes; RCP). The French stopped short of entering Kidal proper, however, and instead left that task to a contingent of 1,800 Chadians who arrived on the 31st and coordinated with the MNLA.

The next major step was remote Tessalit. At this time, the French assembled several SGTIAs along with a large Chadian contingent. One of the SGTIAs was a primarily armored SGTIA formed around elements of the 1st RIMa mounted on AMX-10RCs. The 200-strong contingent included an engineering section and an artillery unit with at least one CAESAR self-propelled 155-mm howitzer. They began in Niamey, Niger, to which they were flown either from France or Dakar, and then drove to Gao, departing on January 31 and arriving on February 2. They soon departed for Tessalit, drove 500 kilometers, and arrived on the eighth. The day before their arrival, 40 French SOF took the airport in an airborne assault, according to a press report.[59] The SOF soldiers have been identified by the same report as members of the 13th Parachute Dragoon Regiment (13e Régiment de dragons parachutistes) and the 1st Marine Infantry Parachute Regiment (1er Régiment parachutiste d'infanterie de marine).[60] They secured the airport and its usable dirt strip, making it possible to bring in reinforcements and equipment.[61] On February 9, ten sappers of the 17th RGP, flying once again out of Abidjan, parachuted with their equipment onto the airport and returned the concrete strip to working order.

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58 "Kidal: La présence supposée d'éléments du colonel Gamou rend encore plus difficile encore le retour de l'armée," *Rfi.fr*, July 7, 2013.

59 Romain Rosso, "Mali: Comment les forces spéciales ont repris Tessalit en quelques heures," *L'Express*, February 21, 2013.

60 Rosso, "Mali."

61 Rosso, "Mali."

Operation Panther

Once France claimed Kidal and Tessalit, the time had come to push into the Adrar des Ifoghas, the mountainous region next to the Algerian frontier that had long been the bastion of the Ifoghas Tuareg confederation, and in more recent times it had also become the redoubt of AQIM.

The Adrar operations involved two GTIAs formed around the units in Tessalit with a combined strength of roughly 1,200 men: GTIA 3 was primarily drawn from the 1st RIMa, and GTIA 4, also known as the Combined Arms Tactical Group–Airborne Troops (Groupement tactique interarmes–troupes aéroportés; GTIA TAP), was basically a GTIA built around airborne units, above all the 1st RCP and the 2nd REP.[62] Backing the two GTIAs were three Puma, two Tiger, and two Gazelle helicopters, as well as two CAESAR howitzers provided by the 11th RAMa, which had raced 500 kilometers in 48 hours to join the offensive in time.[63] Alongside the French elements were 800 Chadians and an unknown number of Tuareg fighters from the Malian Army (Gamou's men) and the MNLA. The Chadians played a key role, particularly in the assault on the Amettetaï valley, in which they worked their way westward while GTIA 3 worked east, and while GTIA 4 moved down from the north.

The fighting lasted through mid-March and was often hard going, particularly in the Amettetaï valley, where, because of the terrain and because the enemy had taken cover among boulders and in caves, French forces had to dismount and flush out enemy fighters, climbing from rock to rock, often engaging at close quarters, all in extreme heat (50-degrees Celsius). Goya claims that French troops in Amettetaï—all of whom were Afghanistan veterans, he says—reported that the primarily AQIM fighters were superior to the Taliban: They maneuvered well and made good use of snipers.[64] When possible, the French used foot patrols to force the enemy to break cover, exposing them to artillery or close air support, and the French have drawn as a "lesson learned" that unless the enemy is already exposed, standoff weapons have to be used in conjunction with "old-fashioned" dismounted infantry.[65]

According to Helluy, the French troops' ability and willingness to fight their way into AQIM's mountain redoubt is another example of the French Army's "audacity" and efforts to retain an element of surprise: The enemy, he said, simply did not expect French troops to come after them in such conditions.[66] It is not clear whether he is basing his assessment of enemy expectations on speculation or intelligence. Helluy also commented that the fighting was a testament to the physical conditioning of the soldiers, who were primarily paratroopers from marine and Foreign Legion units. Goya agreed, commenting that Amettetaï was sort of "revenge for Uzbin," a reference to the Uzbin valley in Sarobi District, Afghanistan, where a French patrol in 2008 was ambushed and badly mauled.[67] Ten French paratroopers and an Afghan interpreter died; 21 French and 2 Afghan soldiers were wounded. The bloodshed was a wake-up call to the French Army, which found that its soldiers were ill prepared for combat as

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[62] Jean-Dominique Merchet, "Nord-Mali: L'opération Panthère se solde par une victoire dans l'Ametettaï (actualisé)," *Secret Defense*, March 5, 2013.

[63] Jean-Luc Bodet, "Coup de pied dans la fourmilière," *Terre Info Magazine*, May 2013, p. 23.

[64] Interview with Colonal Michel Goya, October 3, 2013.

[65] Helluy, "11th Parachute Brigade Presentation"; *Opération Serval*.

[66] Helluy, "11th Parachute Brigade Presentation."

[67] Interview with Colonal Michel Goya, October 3, 2013.

intense as that sometimes encountered in Afghanistan and consequently initiated a "get back to basics" campaign to raise the preparedness level of Afghanistan-bound troops.

In the Adrar, according to Goya, France's audacity paid off, although he noted that it could well have been a catastrophe. Goya also noted the importance of ground forces working in conjunction with fire support and standoff weapons. He said that in Amettetaï the French killed about 100 Islamist fighters. Of those, 80 were killed in close quarters; 12 were killed by helicopters, and 12 by fighter jets. The close combat worked, he said, because the troops had artillery and aviation support. However, the French Army could not have done the job without the ground troops, not just for locating and flushing out the enemy but also because they "needed to plant the flag." It was, he said, akin to the Israeli campaign against Hezbollah, although from his point of view the Israelis did not correctly understand both the importance of the ground campaign and the appropriate coordination of the ground troops with fires.

The Chadians also fought aggressively and provided invaluable assistance, at a cost of the lives of 26 soldiers.[68] They operated independently but with embedded French SOF officers among them, according to Helluy.[69] The SOF, he said, facilitated coordination with French forces and, above all, French fire support. The Chadians also benefited from French logistics and sustainment support—above all fuel, water, and medical assistance.

Gao and the Emergence of an Insurgency

While GTIA 3 and GTIA 4 (TAP) concentrated on the Kidal region and flushing Ansar Dine and AQIM out of the Adrar des Ifoghas, GTIA 2, which was led by the VBCI-equipped 92nd RI, faced an emerging insurgency in the Gao region. Gao had been under MUJWA control, and the Islamist group drew on support from a number of local communities. Twice in February, MUJWA fighters remerged and staged attacks inside Gao, and French, Malian, and other allied forces have fought a number of battles with MUJWA fighters amid their efforts to secure the countryside. For example, on March 1–2, French and Malian forces attacked a MUJWA base in the village of Imenas, killing 52. When they first entered the site, the militants attacked them and fired RPGs at their VBCI. The French broke contact and then attacked again. At one point, the MUJWA fighters launched what was in effect a banzai charge that brought them within ten meters of French positions before getting cut down.[70]

Once the fighting in the Adrar des Ifoghas concluded, France shifted its focus to the Gao region and since then has had to conduct several clearing operations. For example, on April 6 the French launched Operation Gustav, intended to clear a valley north of Gao. The operation involved about 1,000 men led by headquarters elements of the 92nd RI and supported by armor, artillery, drones, and helicopters. There have also been a number of clashes between the MNLA and MUJWA.

None of the precision weapons, such as surface-to-air missiles, that were said to be in the militants' inventories has made an appearance throughout the fighting, although there is evi-

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[68] Jean-Philippe Rémy, "Mali: Dans la vallée d'Amettetaï, l'appui crucial des Tchadiens," *Le Monde.fr*, March 7, 2013.

[69] Helluy, "11th Parachute Brigade Presentation"; *Opération Serval*.

[70] Laurent Lagneau, "Retour sur les combats d'Imènas, près de Gao," March 28, 2013, *Zone Militaire*.

dence that they had MANPADs.[71] It is possible they did not have precision weapons, or that they simply did not work. French forces have captured some heavy weapons and fairly large stocks of mortars and mortar rounds, particularly in the Adrar des Ifoghas, but we have seen no evidence that any of it was used against the French or their allies, or at least not enough to have registered in any published reports.[72] The militants might not have known how to use some of the weapons at their disposal (MUJWA on October 7 fired three mortar rounds into Gao apparently at random). Another potentially significant threat that never materialized was the improvised explosive device (IED), which so far has remained rare despite the Islamists' access to the required supplies. Arguably the most frightening weapon the militants have deployed is the suicide bomber, which they have used sporadically against French and Malian positions in Timbuktu, Gao, and Kidal. For example, on February 26, a bomber in Kidal attacked an MNLA checkpoint, killing seven of the militiamen. On March 20 or 21, a suicide bomber in a car attacked the Timbuktu airport, killing one Malian soldier. There was another suicide bomb attack in Timbuktu, claimed by AQIM, on September 25.

Outcomes: Mission Incomplete

If we return to France's objectives starting out on January 11, Operation Serval had four goals:

1. Stop the terrorist aggression.
2. Secure a country in which there are many thousand French people.
3. Permit Mali to recover its territorial integrity.
4. Free French hostages held by AQIM.

The French appear satisfied that Serval went as well as they had hoped, notwithstanding their failure to liberate the hostages. France saved Bamako and the Malian state from imminent danger and enabled all of Mali's territory to come at least under nominal Malian control, with the arguable exception of Kidal. As for AQIM, MUJWA, and Ansar Dine, the French Senate report noted that eradicating terrorism is hard to do, but at least one can diminish the threat.[73] At the very least, Ansar Dine appears to be gone, and the other two are greatly weakened in Mali for now.

An undated French Army slide on Serval states that there were an estimated 1,200 Islamist fighters, of which 200 were now *hors de jeu* (out of the game).[74] The Senate report, presumably written after the slide, says that between 400 and 500 were "neutralized."[75] The remainder have left the country, gone to ground within Mali, or simply slipped back into civilian life. French Army operations since April 2013, particularly in the Gao region, have concentrated on flushing out remaining pockets of resistance and identifying and destroying arms cach-

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[71] Rukmini Callimachi, "Mali Manual Suggests Al-Qaida Has Feared Weapon," Associated Press, June 11, 2013.

[72] "Mali: Découverte d'armes lourdes dans l'Adrar des Ifoghas (Photos)," *Noorinfo.com*, March 4, 2013.

[73] Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 13.

[74] Helluy, "11th Parachute Brigade Presentation."

[75] Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 13.

es.[76] Total human cost for France: seven killed. A number of allied African soldiers also lost their lives, including at least 30 Chadians. The threat, however, is not completely gone, as evidenced by the suicide bombing in Timbuktu on September 25, 2013, claimed by AQIM and by MUJWA's attack in Gao in October. Answar Dine appears to have dissolved, with some of its members reportedly reemerging around the High Council for the Unity of Azawad, which appears to be the Kel Adagh Amenokal's family's latest attempt to defend its interests and rally elite clans around it. Iyad ag Ghali is in hiding.

The trickier work of using the window of opportunity created by Serval to put Mali back on track toward peace and stability remains. Insecurity is still high, although now it stems less from the extremist threat than from the threat posed to public order by the Malian Army, which allegedly has committed numerous abuses against northern "white" populations, and tensions among and within communities. The MNLA remains active and at odds with the Malian government, as are a variety of other militias, the most important among them being the Arab Movement of Azawad. The French have been extremely reluctant to get involved in what might be described as internal Malian matters and appear dogmatic in their efforts to avoid mission creep or assuming any role resembling that of their colonial forbears. They are, moreover, hopeful that the United Nations Multidimensional Integrated Stabilization Mission in Mali and the Malian government and army will soon be able to fill the vacuum. The problem, however, is that the present insecurity and animosity toward Bamako leave the door open to militancy and rebellion. In the meantime, the French are aware that the mission is not over yet. As late as October 11, 2013, fully 3,200 French troops remained, and on October 1, French forces killed at least ten militants in a clash north of Timbuktu,[77] and there have been other clashes and terrorist attacks since.

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[76] Drew Hinshaw, "French Seek to Prevent Rebel Revival in Mali," *The Wall Street Journal*, September 10, 2013.

[77] "Serval: Point de situation hebdomadaire du 11 octobre 2013," Ministère de la défense, October 11, 2013.

CHAPTER THREE

Discussion

On display in Mali in January through April 2013 was an expeditionary force that in a number of ways exemplified General Odierno's vision of the future force. The most obvious relevant attributes of the French Army in Mali are the small size of the deployment and its practice of task organizing using the SGTIA as a basic, scalable building block, one that locates a great deal of autonomy and initiative with captains. Less obvious is a technological backbone designed to foster coordination and ensure overmatch at all levels, but above all at the lower echelons. Finally, the French, by virtue of their long history in Africa and their routine rotations and deployments there and in their other former colonies, are, in many regards, a regionally aligned force, and they demonstrate the rewards that accrue through their alignment in the form of expertise that helps them operate among and with local and regional actors.

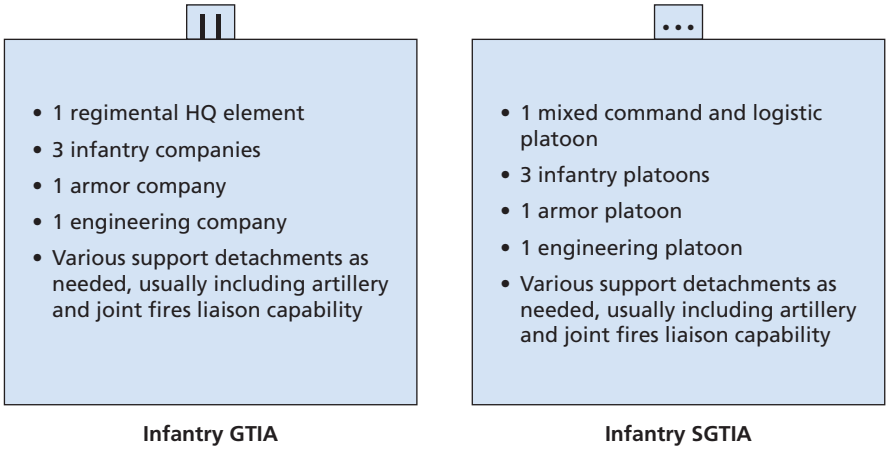
Also of interest are a number of other aspects of the French approach to expeditionary warfare and the French ability to deploy and sustain GTIAs and SGTIAs, and beyond. These include a force structure—in particular a vehicle fleet—that is well suited for operations like Serval, namely in that its relative light weight fosters mobility and helps reduce sustainment requirements. It should also be noted that the French favor mobility over protection, although their vehicles are relatively well armed for their weight class. The French also employ a new fleet management system, which is tied to their force generation cycle and their practice of redeploying vehicles to Africa and elsewhere and is designed to minimize costs. Finally, the French draw on an institutional expeditionary culture arguably forged in the colonial experience, which informs how they approach operations such as Serval.

Task Organization: GTIAs and SGTIAs

One of the signature characteristics of French Army operations in Mali is France's practice of task organizing and fighting as effective and largely autonomous combined arms forces at the battalion level and below, specifically as SGTIAs and GTIAs (see Figure 3.1), with the SGTIAs representing the basic building block of expeditionary forces. French brigades—in contrast with the U.S. Army—are in a sense merely force providers. They do provide an overall command element, with the general in command of a brigade serving as overall commander over the GTIAs in a particular theater. Thus, all the GTIAs participating in Serval become known as the Serval Brigade. That said, by no means are all the participating units drawn from the same brigade.

The basic design presented in Figure 3.1 represents the textbook model. As mentioned earlier, the ad hoc task forces deployed to Mali (and since to the Central African Republic)

Figure 3.1
Combined Arms Tactical Groups (GTIAs) and Combined Arms Tactical Subgroups (SGTIAs)


II
• 1 regimental HQ element
• 3 infantry companies
• 1 armor company
• 1 engineering company
• Various support detachments as needed, usually including artillery and joint fires liaison capability
Infantry GTIA
...
• 1 mixed command and logistic platoon
• 3 infantry platoons
• 1 armor platoon
• 1 engineering platoon
• Various support detachments as needed, usually including artillery and joint fires liaison capability
Infantry SGTIA

SOURCES: *Manuel d'emploi du groupement tactique interarmes à dominante infanterie; Manuel du sous-groupement tactique interarmes.*

RAND *RR770-3.1*

have varied with the basic design to some degree, reflecting some combination of French commanders' assessment of mission requirements and unit availability. For example, the 850-man-strong GTIA 3, which took part in the assault in the Adrar mountains, was composed of the following elements:

- Tactical command element
- One light tank company (12 AMX-10RCRs)
- One logistics company (66 GBC trucks)
- One mechanized infantry company (54 VBL/PVP, 87 VABs)[1]
- One combat engineering company
- One artillery group with two CAESAR 155-mm self-propelled howitzers and four 120-mm mortars
- One drone and electronic warfare/signals intelligence detachment
- One air coordination platoon.[2]

One of the hallmarks of the SGTIA is its combined arms status, specifically the integration of fire support and fire support coordination capabilities. In Mali, the SGTIAs had at their disposal 120-mm mortars and 155-mm CAESAR howitzers, not to mention the guns on their armored vehicles. They also could call in and coordinate with attack helicopters and joint fires, in this case French Air Force Mirage F1 and Rafale fighters. SGTIAs all have at least two captains, with the second-in-command the designated fires coordinator. And they usually have working for them the equivalent of a joint terminal attack controller and often a "liaison observation and coordination detachment" intended to provide the commander with one-stop

[1] A PVP is a *petite véhicule protégé* (small protected vehicle), basically a small (4.4-ton) mine-resistant ambush protected (MRAP) vehicle.

[2] Information courtesy of Colonel Jean-Vincent Berte, July 15, 2014. See also *Opération Serval*, p. 47.

shopping for "managing fire support and integrating them with maneuver in order to furnish him in the right place and at the right time the fire support best adapted for the desired tactical effect."[3] Indeed, a French military document assessing Serval cited a colonel who insisted that joint integration was a key element in France's success, and that joint integration "took place at the SGTIA level and even that of the reinforced platoon."[4] The colonel continued: "Today, joint integration happens at the level of the lieutenant, if not lower. Our lieutenants and our captains from now on dispose of a range of capacities and have to know how to combine their effects."[5] In addition, SGTIAs have organic intelligence elements, including signals intelligence officers. In Afghanistan they have embedded human terrain teams.[6]

While the U.S. Army also commonly task organizes at the subbrigade level as a matter of necessity, the French Army does it as a matter of doctrine, practice, and habit. They train as GTIAs and SGTIAs and deploy and fight as such. French units rotate through their national training centers as SGTIAs;[7] French Army captains study the art of commanding SGTIAs as part of their formal training.[8] By the time those who participated in Operation Serval (or operations in Afghanistan) arrived in theater, they already had extensive experience conducting operations in Africa and elsewhere as part of GTIAs and SGTIAs, even if the particular GTIAs and SGTIAs to which they were newly assigned were pulled together ad hoc. One possible benefit of this approach to deployments is that the French Army is comfortable sending relatively small force packages into action. It could rush a 200-man SGTIA to Mali from Chad within 24 hours, and do so knowing that the SGTIA, despite its size, had as good a set of capabilities as could be desired of a collection of 200 soldiers. Moreover, as French forces poured into Mali and mission objectives shifted from day to day, week to week, the GTIAs and SGTIAs formed and re-formed quickly and operated as effective and coherent units, something that probably gives French commanders a significant degree of flexibility and organizational adroitness. For example, as the French paratrooper magazine *Béret Rouge* pointed out, the marine, Foreign Legion, airborne, cavalry, and other units that formed the first GTIA in Mali were detachments from separate long-standing GTIAs operating in Chad and Côte d'Ivoire; their fusion into a new command structure does not appear to have incurred significant problems. As the campaign progressed, French commanders routinely pulled together ad hoc units from a variety of different regiments and brigades, including marines, legionnaires, cavalry troopers, sappers, and artillerists, in order to respond to aggression as quickly as possible."[9] They could, moreover, reaggregate and disaggregate the GTIAs apparently at will.

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3 François Villanueva, "L'intégration des appuis au niveau du SGTIA," *Doctrine Tactique*, no. 21, March 2011, p. 15.

4 *Opération Serval*, p. 13.

5 *Opération Serval*, p. 13.

6 "Les enseignements tirés des engagements des SGTIA en OPEX," *Doctrine Tactique*, no. 21, March 2011, pp. 19–20.

7 "L'entraînement au combat interarmes," *Terre Information Magazine*, November 2010, pp. 6–7; "Les principles d'entraînement des sous-groupements interarmes (SGTIA) au CENTAC," *Doctrine Tactique*, March 2011.

8 For a discussion of the prominence of the SGTIA in the formal training of French Army captains, see Frank Bossion, "La formation des capitaines: Du cours des futurs commandants d'unité de cavalerie au commandement d'un sous-groupement tactique interarmes à dominante blindée," *Doctrine Tactique*, no. 21, March 2011, pp. 28–31; Lieutenant Colonel de Préval, "Les principes de la formation du 'capitaine interarmes' à l'école d'infanterie," *Doctrine Tactique*, no. 21, March 2011, pp. 25–27.

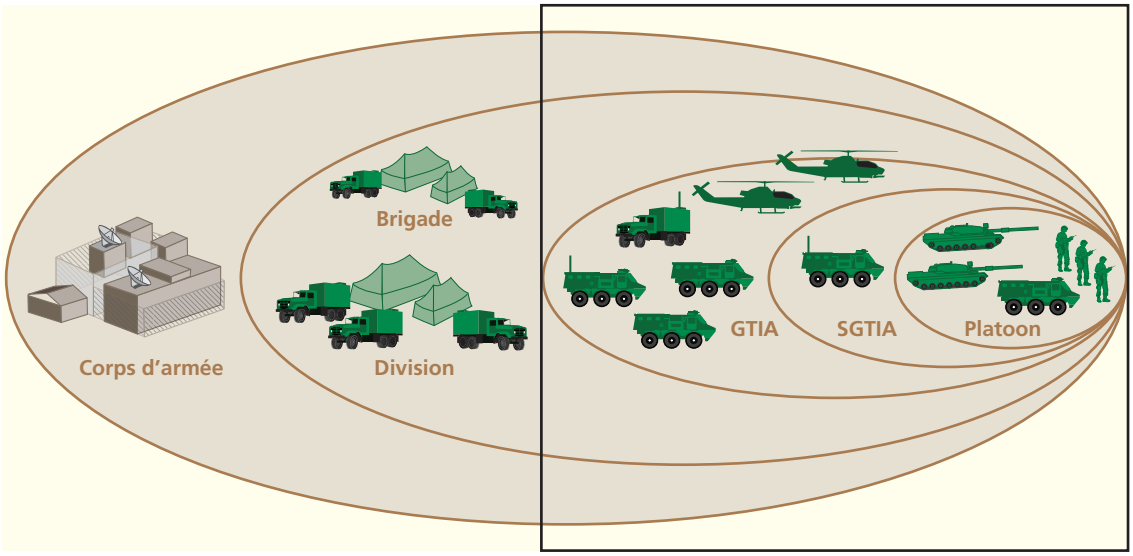
9 "L'engagement des forces prépositionnées en Afrique," p. 8.

It should be noted that Goya does not share the view that everything went without a hitch. He distinguishes between SGTIAs that trained and deploy together, such as those deployed to Afghanistan, and the ad hoc SGTIAs formed on the fly in Mali.[10] The latter, he said, because of the haste with which they were put together and the fact that they were often composed of units from different brigades, suffered from problems associated with communication and coordination. They did fine in Mali, but he suggested that the results might have been very different if faced with a more effective enemy.

Technology and Networking

French expeditionary forces increasingly benefit from the French Army's investment in network and information management systems intended for GTIA-level echelons and below, down to individual vehicles and dismounted soldiers. Some of the systems are being fielded now, although the overall system of systems referred to by the French as SCORPION will not be in place by 2025. The idea, which resembles the kind of networked systems that Odierno has evoked for providing overmatch capabilities at every level, is to use networks to enhance situational awareness, command and control capabilities, and fires coordination abilities, in effect by networking together each element within a SGTIA while plugging the whole into the larger networks represented by the GTIA (see Figure 3.2) and the overall joint force. SCORPION is intended to make French units more effective despite being more dispersed and often

Figure 3.2
Planned Deployment of SCORPION



SOURCE: Information from Nicolas Perche, "SCORPION Program," Direction générale de l'armement, Ministère de la défense, 2011.
RAND *RR770-3.2*

[10] Interview with Colonal Michel Goya, October 3, 2013.

smaller, as well as more easily sustained and more durable during an extended deployment; it is a key to fighting the kind of fast-paced and relatively low-budget maneuver warfare that the French would like to fight.

Serval did not benefit from the technology, at least not in the phase described here. In fact, according to General Olivier Tramond, current-issue French communications gear was inadequate for the huge expanse of terrain that he qualified as "well beyond the theoretical area of operations for a single brigade."[11] French units relied on nonstandard global network and satellite communications gear that could not be used on the move.[12]

At the SGTIA level, the French investment in networking technology is best represented by FÉLIN (Fantassin à équipement et liaisons intégrés; Infantry Soldier with Integrated Equipment and Networks)—a suite of sensors and communications devices worn by dismounted infantry—and the VBCI, which functions as the hub of the network formed by the dismounted soldiers and is also networked to other VBCIs and the VBCI command vehicles. Other vehicles, including the CAESAR, are being equipped with the networking technology as they are modernized. None of the regiments involved in Serval during the period studied here was equipped with FÉLIN, although subsequent units have had the gear, as have units deployed to the Central African Republic as part of Operation Sangaris, which began in December 2013.

One intriguing aspect of networking technology that might have played a role in Serval is its application for logistics. According to a French military publication, the army is digitizing its logistics operations with the aim of achieving significant efficiencies by enabling it to anticipate precisely how much of a given supply needs to be provided, when it is needed, and where it should go.[13] Thus, the technology, the French are hoping, will not only make its GTIAs and SGTIAs more effective but also enable its units to remain effective longer: "Anticipate, react: The laws of logistics are the same; and the complete integration of the GTIA in a digital environment will without doubt contribute to its ability to endure without wearing out."[14]

Regional Expertise

Another important asset for the French is their regional expertise and ability to supplement their own strength with local and regional auxiliary forces. This has arguably been standard practice for the French since their conquest of West Africa in the late 19th century and their colonial administration of it through to decolonization in 1960. Although the French Army trains for large-scale conventional warfare, most of its experience has been with small-scale deployments to Africa and other austere environments. All French Army units rotate through Africa on four-month "short-duration missions." France's expeditionary brigades, moreover, contain a disproportionate number of marine and Foreign Legion regiments, which historically have focused on colonial operations. These, in addition to their short-duration missions,

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[11] Olivier Tramond and Philippe Seigneur, "Early Lessons from France's Operation Serval in Mali," *Army Magazine*, June 2013, p. 43.

[12] Tramond and Seigneur, "Early Lessons from France's Operation Serval in Mali," p. 43.

[13] "Le maillon fort," *Terre Information Magazine*, June 2010, p. 39.

[14] "Le maillon fort," p. 39.

do two- or three-year "long-term missions" in Africa. The repeated rotations arguably reinforce the expeditionary character of these units.

As discussed earlier, France has been working with at least two Malian Tuareg forces, Haji ag Gamou's Malian Army units and the MNLA. France's relations with Gamou's force and the MNLA, though not free from problems and controversies, suggest a high degree of familiarity with northern Malian affairs as well as the ability and willingness to engage local forces and, in effect, leverage internal Tuareg factional competition. French forces almost certainly knew what they were doing and with whom they were dealing before they arrived in Mali. They did not have to scramble to get up to speed. That said, the near collapse of the Malian state and the Malian Army in 2012 puts into question the efficacy of French support to those institutions prior to Serval. Further research is required to understand how France conducts training missions, for example, and how and to what extent regional expertise helps their efforts.

Force Structure

The French Army operates a force structure well suited for precisely the kinds of operations it has been conducting on Mali. To be more specific, France has opted to mechanize nearly all of its units, using relatively light, wheeled armored vehicles that can be transported in C-130s and C-160s as well as driven long distances over poor-quality roads and cross-country (e.g., from N'Djamena to Libreville, or from Dakar to Tessalit). While lacking the level of protection of main battle tanks and heavy infantry fighting vehicles, the wheeled armor units of the French Army do provide considerable firepower. French light armored vehicles are equipped with 105-mm guns (AMX-10RC), 90-mm guns (ERC 90), and 25-mm automatic cannons (VBCI), which are able to fight on the move, thus giving the French units capabilities that Stryker brigades lack (see Table 3.1). The armored reconnaissance and combat vehicle (*engin blindé de reconnaissance et de combat*; EBRC), slated to replace the AMX-10RC within the decade, has been tested with a 120-mm gun, according to one report.[15]

Table 3.1
French Armored Vehicles in Mali, 2013

Vehicle	Type	Weight in Tons	Main Armament
VBCI	Infantry fighting vehicle	24–28	25 mm
AMX-10RC	Light tank	17	105 mm
VAB	Armored personnel carrier	13	.50 caliber
ERC 90 Segai	Light tank	8.9	90 mm
PVP	Light tactical vehicle	5.3	Up to 12.7 mm
VBL	Light tactical vehicle	4.2	Missiles, 12.7 mm, or 7.62 mm

SOURCE: "Equipements: Vehicles," Ministère de la défense, July 31, 2013.

NOTE: France has also fielded a large number of unarmored vehicles, including numerous utility trucks, G-Wagon derivatives, and the CAESAR, a 17.7-ton self-propelled 155-mm howitzer.

[15] "Scorpion Exites French Combat Vehicle Industries," *Defense Update*, n.d.

The French, in fact, have doubled down on their commitment to light armor as they modernize. The VBCI (Figure 3.3), which entered service recently and has been deployed to Afghanistan, and the multirole armored vehicle (*véhicle blindé multi-rôles*; VBMR) and EBRC, which are due to enter service by 2020, are heavier than the vehicles they are intended to replace and offer greater protection, including add-on armor kits. However, they remain roughly in the Stryker weight class (the VBCI weighs in at 25.6 tons, and the VBMR and EBRC are expected to be lighter or roughly the same). French developers have focused on maintaining their predecessors' mobility while enhancing their capabilities, primarily by means of technology-enabling networked warfare. The VBCI, VBMR, and EBRC are designed to be integral to SCORPION, meaning that they ostensibly will exercise high degrees of situational awareness and fight in close coordination with networked dismounted infantry (FÉLIN), other vehicles, artillery, and air support.[16] The French are apparently confident that with such a force constituting the core of their army—reinforced by main battle tanks when required—they can handle most foreseeable combat scenarios, including high-intensity conventional warfare.

Interestingly, there appears to be a current within the French Army that favors lower-technology vehicles such as the venerable VAB, AMX-10RC, and ERC-90, all of which are slated to be replaced by SCORPION-compliant vehicles such as the VBCI and VBMR. Goya, for example, has argued in the past that perhaps cheaper, simpler weapons would be preferable because their lower cost would enable the army to invest in quantity and training.[17] With

Figure 3.3
The French VBCI

SOURCE: Photo by Daniel Steger, June 17, 2006, shared via OpenPhoto.net, CC BY-SA 3.0.
RAND *RR770-3.3*

[16] "Le programme Scorpion," Ministère de la défense, June 6, 2012.

[17] Michel Goya, "Dix millions de dollars le milicien: La crise du modèle occidental de guerre limitée de haute technologie," *Politique Étrangère*, no. 1, 2007, p. 201.

regard to Mali, the French claim to have found that the low-tech nature of the vehicles used in Mali was a virtue. Most of the French vehicles in Mali—with the notable exception of the VBCI and arguably the CAESAR and VBL—are old and slated for replacement or at least modernization. The French now say that their outdated equipment proved less delicate than newer equipment and easier to fix in the field. For example, a *Béret Rouge* issue dedicated to Serval commented that

> the simplicity [*rusticité*] of the ERC [light tank] contributed to the success of the attacks. Despite the lack of replacement parts, the ERCs continued to roll in emergency mode. Thanks to the ingenuity of the force, maintenance was assured. Small repairs were made by the drivers themselves.[18]

The magazine concluded:

> The first weeks of the ground war were conducted with often old equipment issued from the fleets of the forces prepositioned in the region: the VAB, the ERC 90, the VBL, the VLRA [*véhicule léger de reconnaissance et d'appui*; light reconnaissance and support vehicle]. . . . These vehicles were subjected to a harsh test but once more demonstrated their effectiveness and their robustness. Their relative mechanical simplicity and the absence of fragile electronics facilitated jury-rigged repairs. This range of multirole vehicles, with light logistical requirements and adapted to difficult terrain, rendered eminent services before more modern and heavier equipment could be deployed.[19]

Not everyone was pleased by the performance of the aging vehicles. GTIA 3's commander commented, for example, that the VAB and AMX-10RC were "breathing their last," and their "performance reached a level that was at times preoccupying and makes their replacement indispensable for continuing to conduct engagements at this level of difficulty."[20]

French motorized infantry and light armor units have fewer logistical requirements compared with a heavy armor force. Given the generally poor infrastructure in countries like Mali, the reduced logistics burden of these units is an advantage. France, for example, sourced all but jet fuel from African refineries and demonstrated an ability to meet the military's fuel requirements in Mali with what is by all accounts a light logistical tail.[21] According to a French Army briefing on Serval that compared it with the French Army's Operation Pamir in Afghanistan, Serval logistical needs were heavily reliant on (limited) air transport capabilities, and Serval units had to operate with greater autonomy, meaning that they often had to move while transporting their own supplies.[22] Greater fuel and other requirements obviously would have necessitated a more robust and costly logistical effort, perhaps on a scale that would have been beyond France's means even with the logistical assistance it received from its allies.

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[18] "L'engagement des forces prépositionnées en Afrique," p. 6.

[19] "L'engagement des forces prépositionnées en Afrique," p. 8.

[20] *Opération Serval*, p. 50.

[21] The French Army's Fuel Service drew on personnel and equipment that were prepositioned in Africa and reinforced them with personnel and equipment sourced from France. The total size of the Fuel Service in Mali reached 100 men and women, according to the French Ministry of Defense website. France appears to have abstained from contractor support. See "D'Abidjan à Tessalit, le SEA au cœur du dispositif Serval," Ministère de la défense, July 16, 2013.

[22] "Briefing Land Forces May 2013."

The high mobility of French armored vehicles has also given the French Army a degree of flexibility with regard to how it gets armored vehicles to the theater of operations and moves them around once there, and to what extent it draws on vehicle fleets already in the region as opposed to dispatching them from France. The participating units came from a variety of sources near and far (see Figure 3.4 and Table 3.2). Most arrived in theater by air, but a significant portion drove to Mali. With regard to air operations, the French required help from the U.S. military and others, and as detailed earlier, allies provided 75 percent of the airlift required and 30 percent of the aerial refueling capability.[23] Operation Serval involved an eclectic fleet of aircraft, including Canadian, U.S., and UK C-17s, and a variety of other aircraft supplied by Belgium, Denmark, Germany, and others. According to a French military website, as of January 21 there were seven C-17s at the disposal of Operation Serval.[24] France also used civilian airliners to transport personnel, and it rented Ukrainian Antonovs to supplement the C-17s.[25] France has just begun receiving and using the new A-400M transport plane, which has roughly a 30-ton payload capacity and a range of more than 2,500 miles.[26] This new

Figure 3.4
Ground Movements of French Armored Vehicles, January–March 2013

SOURCE: Map data ©2014 Google, ORION, ME, basado en BCN IGN España; distance measurements from Mapcrow.info.

RAND *RR770-3.4*

[23] Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 20.

[24] "Opération Serval: Point de situation du 22 janvier 2013," Ministère de la défense, January 22, 2013.

[25] For a video of French vehicles loading onto an Antonov in Ndjamena on January 14, see "Opération Serval—14 janvier 2013: Chargement des véhicules dans Antonov pour le Mali," video, posted by FORCESFRANCAISES, January 7, 2013.

[26] "First A400M Operational Mission Flown into Africa," *DefenceWeb*, January 9, 2014.

Table 3.2
French Military Vehicles Flown or Shipped (via Sealift) to Mali, as of April 2013

Vehicle Type	Number
Pilatus airplane	1
Cougar/Puma helicopter	11
Gazelle helicopter	6
Tiger helicopter	6
VBL light armored vehicle	109
VAB armored personnel carrier	177
VBCI infantry fighting vehicle	36
AMX-10RCR light tank	21
CAESAR self-propelled howitzer	4
GBC cargo truck	154

SOURCE: "Operation Serval," PowerPoint, Centre de doctrine d'emploi des forces/Division recherche et retour d'expérience, April 9, 2013.

NOTE: The French sealift included the *Dixmude* as well as two roll-on/roll-off vessels, *Eider* and *Louise Russ*.

aircraft will be an ideal complement to the light armor and motorized infantry units of the French Army.

Once in Mali, the French units, armor included, had to cover a lot of ground. For example, the commander of GTIA 3 boasted that his battalion, during six weeks of operations, remained almost entirely "in the zone of operations, near or in contact with the enemy, without returning to base, without technical pauses, and without conducting repairs." He continued: "Each vehicle traveled 2,500 to 5,000 kilometers" off-road and on difficult terrain.[27]

French logistical capabilities, it should be made clear, were stretched to their extreme limits, even with airlift borrowed from allies. The troops that France rushed to Mali initially had with them only the essentials (in many cases, three days' worth of food and nine liters of water), and the subsequent focus of logistical efforts remained on providing the bare essentials (food, water, fuel) as troops raced north and east.[28] France also assumed responsibility for sustaining the Chadian force; it may well have done the same for some of the other African contingents in theater. France did get some help from Algeria, which quietly furnished fuel and water.[29] In late March a leading defense blogger reported, based on his contacts in the French Army, that ground troops were just barely keeping their vehicles in working order.[30] A news report of the fighting in the Adrar des Ifoghas described the operations in terms of "roughing

[27] *Opération Serval*, p. 48.

[28] Brunetaud, "La chaîne soutien en opérations," p. 10.

[29] Roux, "RAND Corporation Conference."

[30] Philippe Chapleau, "Rusticité et ingéniosité: Malgré tout, les véhicules tirent la langue au Mali," *Lignes de Défense*, March 30, 2013. The same blogger put the number of vehicles operated by the Serval brigade at 730, including 150 VABs, 100 VBLs, 36 VBCIs, and 20 AMX-10RCs.

it." It commented that the army had been in the field for a month and that the logistical support was providing water, food, and fuel, but otherwise the troops were left to get by as best they could. It was "the price to pay for taking so many people so far in so little time."[31] Colonel Bertrand Darras, who at the time was with the French Ground Forces Command, commented that the troops in Mali after a few weeks in the field resembled "Napoleon's army before the Italian campaign" more than it did a fully equipped modern force, because of the condition of their equipment, uniforms, boots, and so on. They had no air conditioning, showers, or toilets, he said, and had trouble sleeping because of the heat: "We disregarded all standards to keep the high momentum required to destroy as much of the enemy as we could."[32] The one part of their kit that the French identify in their briefings on Serval as having been unacceptably inadequate is their boots, which literally became unglued in the Saharan heat.[33] There might be new service boots in the French Army's near future.

The statements about Serval contain a great deal of self-congratulations, but they make clear that the French had little in the way of excess sustainment capacity, particularly in light of their reliance on others to provide strategic airlift. Any savings, such as that which might have come from using wheeled versus tracked vehicles, probably helped a great deal. Any of the anticipated efficiencies that might have accrued, from the application of SCORPION to logistics, or might accrue in the future would no doubt also be welcome.

The work of supplying Serval on the ground was done by elements of the French Army as opposed to contractors, specifically the units that answer to the French logistics command and were attached to various GTIAs, such as elements of the Combat Support Regiment (Régiment de soutien du combattant, RSC), although the first members of the RSC did not arrive in Mali until January 17.[34] According to a French Army briefing dated May 2013, the logistics elements involved in Operation Serval included:[35]

- One theater logistics command post
- Three logistical subgroups, consisting of:
  - Four transport platoons
  - Four traffic control platoons (which escorted the convoys)
  - One fuel and lubricants detachment
  - One materials company
  - Three quartermaster detachments (responsible for food, clothing, sleeping arrangements, etc.)
  - Three surgical "antennas"
  - Two urgent surgical "modules"
  - Two air dispatch detachments (in Bamako and Niamey).

The French established a battalion logistics command at Gao, a joint theater support group in Bamako, and a subgroup each in Gao and Tessalit. The transport and traffic platoons

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31 Etienne Monin, "Les derniers jours de la guerre dans l'Adrar au Mali—France Info," *France Info*, March 25, 2013.

32 Colonel Bertrand Darras, email, April 28, 2013.

33 Roux, "RAND Corporation Conference."

34 Brunetaud, "La chaîne soutien en opérations," p. 12.

35 "Briefing Land Forces May 2013."

moved supplies—above all water and fuel—from Bamako to Gao and from Gao to the rest of the theater.[36] The French also established a munitions depot in Tessalit to supply the GTIAs that were operating in the region.[37] All told, almost 1,000 soldiers were involved during the peak of operations, roughly a quarter of Serval's overall force at the time.[38]

The surgical "antennas" and "modules" refer to field hospitals. An antenna unit is a light, air-transportable unit designed with the capacity to serve the needs of 1,000 soldiers "exposed to occasional losses." It is designed to be able to deploy within three hours and function without resupply for 48 hours. It can handle eight wounded a day and has ten beds for recovering patients. An antenna can also become the basis of a larger, more permanent structure. In contrast, a module provides only urgent critical care, after which patients must be evacuated immediately. The equipment associated with a module weighs less than a ton and can be transported by helicopter or dropped by parachute.[39]

The French Army subscribes to the American concept of the "golden hour," the idea that wounded soldiers need to receive critical care within an hour of receiving their injuries. In the case of Serval, French Army sources have stated that they were operating without adequate coverage to meet the golden hour standard of care. They had to make choices about how to divide medical coverage, such that an operation in one place might have adequate coverage to meet the golden hour standard while another operation going on at the same time somewhere else did not.[40]

Force Generation and Vehicle Fleet Management

Two related aspects of French Army operations that contributed to France's success in Mali were the apparent efficacy of its force generation system, which the French refer to as their *operational cycle*, and their Fleet Use and Management Policy (Politique d'emploi et de gestion des parcs; PEGP). With regard to force generation, France had at its disposal in Africa on January 11 enough troops in the final deploy/ready stage to rush to Mali, form the first GTIA, and block the Islamist advance. For the rest, France turned to Guépard, meaning the pool of soldiers who, upon reaching a particular degree of competency toward the end of their training cycle, are set aside for contingency operations. Roughly 80 percent of the troops in Mali during this time were Guépard, according to Darras, who until recently was with the French Ground Forces Command in Lille. The French regard the effectiveness of the Guépard forces in Mali as the fruit of their Afghanistan experience, and, in particular, the ramped-up training provided to Afghanistan-bound soldiers in the aftermath of the Uzbin ambush in 2008. As mentioned earlier, Uzbin made French forces conscious of the fact that they had, in effect, gotten soft as a result of conducting so many stability operations, largely in Africa, and were no longer as proficient in basic war fighting as they had believed; Afghanistan required a sharper edge. France boosted its predeployment training, and most of France's combat units at this point have rotated through Afghanistan, meaning that they have been direct beneficiaries of

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[36] Grégoire Chaumeil, "Logistique, l'autre combat," *Armées d'aujourd'hui*, May 2013, pp. 36–37.

[37] Chaumeil, "Logistique, l'autre combat," p. 38.

[38] Chaumeil, "Logistique, l'autre combat," p. 36.

[39] Information provided by Lieutenant Colonel Michel Monnier, July 30, 2013.

[40] Roux, "RAND Corporation Conference."

the post-Uzbin training. *Béret Rouge*, for example, directly attributed the soldiers' proficiency in Mali to Afghanistan:

> This generation of force in an emergency was only possible thanks to the tremendous current interoperability of the ground forces, which has been forged in the Afghan crucible. The normalization of the training, the development of combined arms in the training centers and the certification of operational skills during predeployment training have paid off and must be preserved.[41]

The reliance on Guépard troops brings PEGP into play. PEGP is a fleet management system instituted by the French Army over the course of the past decade that aims to reduce costs significantly while increasing readiness.[42] The system involves centralizing vehicle maintenance and fleet management and, in effect, rationing out vehicles to units as needed in a roughly just-in-time approach rather than having units maintain their own vehicle fleets. The system lowers the overall number of vehicles required, creates economies of scale with respect to maintenance operations, maintains facilities and operations, and ostensible boosts readiness by ensuring that units have access to ready vehicles when they need them, rather than having them deal with pools of vehicles that are only partially operable, if working at all. As part of the PEGP system, Guépard troops have in their possession only a portion of the vehicles they require. Only when troops deploy or conduct training at one of France's national training centers do they have a full vehicle inventory.[43] The system is designed to ensure that troops get what they need, when they need it, and it also has mechanisms for backfilling the "ready" pools. The available evidence suggests that PEGP has worked: Units deploying to Mali received what they needed, when they needed it, and there is no evidence that their training levels have suffered as a result of PEGP. Indeed, according to Darras, PEGP arguably has resulted in improved training simply because it has forced commanders to be more deliberate and thoughtful about how they train. Darras does, however, sound a note of caution: Thanks to Afghanistan, PEGP was stood up and run in the context of a high operational tempo, and there is a risk that, once the tempo slows, the administrations running PEGP will gear down and focus more on efficiencies. They may consequently become less responsive and less capable of supporting a rapid deployment like Serval.[44] It also is not clear whether PEGP is providing the financial savings that it is expected to.

PEGP and Theater-Provided Equipment

The fact that France maintains military assets in Africa should not be overlooked. Under PEGP, France maintains a permanent service pool of vehicles at the immediate disposal of deployed and certain other units, which are in fact routinely rotated through the PEGP system for regular maintenance. The French troops that regularly deploy to Africa, in particular to Chad or Côte d'Ivoire, do not bring their vehicles with them but use the fleets that are already

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[41] "Par les airs et par la piste," *Béret Rouge: Le Magazine des Parachutiste*, May 2013, p. 8.

[42] PEGP resembles the *whole fleet management* concept in Britain. For more information, see "Tout savoir sur la PEGP," *Armée de Terre*, July 27, 2012; and the June 2011 issue (no. 43) of the French Army's journal on doctrine, *Héraclès*.

[43] For more information on the Army's rotational equipping, see Christopher G. Pernin et al., *Efficiencies from Applying a Rotational Equipping Strategy*, Santa Monica, Calif.: RAND Corporation, MG-1092-A, 2011.

[44] Colonel Bertrand Darras, personal communication, September 5, 2013.

on hand (essentially, theater-provided equipment). Those are rotated out annually and replaced with new ones. They are transported by ship. According to Darras, the vehicles stationed in land-locked Chad drive back and forth to the port at Libreville, Gabon, where they embark on or disembark from ships.[45] The presence of so many vehicles abroad, as well as the French Army's frequent deployments, means that maintenance cannot be entirely centralized: The Maintenance Division attached to the Ground Forces Command (the French equivalent of the U.S. Army Forces Command) is responsible for ensuring that deployed regiments have attached to them appropriate resources for maintaining and repairing vehicles in the field.[46]

France's Expeditionary Culture: A Way of War Well Suited for Scarcity

Lastly, a less tangible yet significant factor in French operations in Mali is an expeditionary culture that at the very least serves the French Army well when operating at a small scale with limited resources. This might be particularly true of France's expeditionary units, most if not all of which historically have had an explicitly colonial vocation, most obviously the "troupes de Marines" and the Foreign Legion. These, it should be stressed, are not SOF (although there are French Marine SOF regiments as well as commando-qualified legionnaires) but rather general-purpose forces with a long-standing expeditionary mission and outlook.

For most of the past two centuries and up until the end of the Cold War, France effectively maintained two services, each with different institutional cultures: one large force dedicated to the defense of France against Continental threats and a much smaller, specialized force with the vocation of defending the empire abroad.[47] A 1921 law formalized the distinction as well as the critical fact that the former Continental force drew its personnel from conscripts, while the expeditionary, colonial force was entirely professional.[48] In fact, by law, draftees could only be sent overseas if they volunteer to go, and the only time conscripts served overseas was in the Algeria war, when Algeria was technically part of France.[49] The law remained in place after decolonization in 1960, thus preserving the distinction even though France's expeditionary units, formally at least, had lost their colonial missions. Only in 1996, after the expiration of the Cold War brought an end to the need for a large, heavy Continental force—and after the Persian Gulf War revealed France's inability to deploy significant numbers abroad despite the large size of the overall force—did France overturn the 1921 law and, in effect, make the entire army a professional and thus expeditionary one. That said, France's ex-colonial units have continued to be its go-to units for responding to emergencies as well as providing the French Army's expeditionary capabilities.

Among the aspects of colonial operations that arguably have some relevance for today is the small size of French deployments, the degree of autonomy that unit commanders exercised, the high degree of risk they accepted, and their interest in leveraging local knowledge. The

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[45] Colonel Bertrand Darras, personal communication, May 7, 2013.

[46] Patrick Hocquard, "L'action de la division maintenance du commandement des forces terriestres (CFT)," *Héraclès*, no. 43, June 2011, p. 11.

[47] Bastien Irondelle, *La réforme des armées en France*, Paris: SciencesPo. Les Presses, 2011, p. 47.

[48] Irondelle, *La réforme des armées en France*, p. 48.

[49] Irondelle, *La réforme des armées en France*, p. 48.

available evidence regarding France's conquest and administration of northern Mali, for example, suggests that the French military presence never counted more than a hundred French officers and noncommissioned officers in command of a thousand "Senegalese infantry," who were recruited from throughout France's African possessions.[50] The small size of French colonial deployments reflects the French military's priorities at the time (defending France against Continental threats) and a lack of conviction regarding the value of the colonial enterprise: Conquest and colonization would take place on the cheap or not at all.[51]

France owes its success in northern Mali during the colonial period up until Mali's independence in part to the practice of commanders and administrators attending to local politics and the human terrain, so as to better deploy divide-and-conquer tactics, forge military alliances, and so on.[52] They demonstrated a fair hand at knowing whom to trust, whom to promote, and whom to push aside.

Goya, himself a marine, argues that much of the outlook and practices of France's colonial units have survived and serve them well today. He describes today's marine regiments' approach explicitly as "colonial," and defines it in terms of a "global approach" that involves not just tactics but mixing in with the population and understanding the entire context in which one is operating. (A 2010 issue of the French military publication *Doctrine Tactique* refers to this as "global maneuver" and associates it with counterinsurgency.)[53] When asked about institutional continuity from the colonial era, Garnier, also a *marsouin* (the French equivalent of leatherneck), questions cultural continuity yet notes that French marine regiments today operate in the same conditions as in the past, suggesting that, in effect, they operate in the same way.[54]

French officers interviewed by the author also draw a distinction between how they are taught to operate and the "American way," with which they have become familiar in Afghanistan. According to Garnier, for example, the U.S. Army can fight "properly" in the sense that

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[50] According to Pierre Boilley, in 1913 the French military presence in northern Mali counted 1,019 indigenous soldiers under the command of 21 French officers and 53 French noncommissioned officers. See Boilley, *Les Touaregs Kel Adagh*, p. 116. We have no comparable figures for other years during the period of conquest (1894–1916), but the history of the conquest and the entire colonial period strongly suggests that the numbers are unlikely to have been significantly greater at any time. Certainly in 1916, at the time of the final Kel Iwellemmeden rebellion, the French Army would have been extremely reluctant to dispatch reinforcements to Mali, even if it were able to.

[51] The French government could not muster a consensus about Algeria, for example, and would not commit the resources required to pacify it until an insurrection that began in 1841 forced France, in effect, to choose between leaving and going all-in. It chose the latter. With regard to the conquest of the rest of Algeria, the Sahara in general, or West Africa, there was never a consensus, nor was it ever France's policy to conquer the entire region. It happened piecemeal and often as the result of the initiative of local commanders or interested civilian parties. For a good general history, see Douglas Porch, *The Conquest of the Sahara*, New York: Farrar, Straus and Giroux, 2005.

[52] It should not be forgotten that Bonnier's immediate successors were no less aggressive and generally brutalized Tuaregs. See Bruce S. Hall, *A History of Race in Muslim West Africa, 1600–1960*, Cambridge, UK: Cambridge University Press, 2011, pp. 136–137. Hall tells a darker story than Boilley, although his account ultimately confirms the argument that French knowledge of the local populations more than force of arms resulted in success. For more on French colonial administrative practices in northern Mali as well as French colonial administrators' understanding of northern Malian society, see Edmund Bernus, Pierre Boilley, and Jean Clauzel, *Nomades et commandants: Administration et sociétés nomades dans l'ancienne A.O.F.*, Paris: Karthala, 1993; J. Clauzel, "Évolution de la vie économique et des structures sociales du pays nomade du Malil: De la conquête française à l'autonomie interne (1893–1958)," *Tiers-Monde*, vol. 3, nos. 9–10, 1962, pp. 283–311. Clauzel served as the head of the colonial administration in northern Mali from 1946 to 1958.

[53] See issue no. 19 of *Doctrine Tactique*, "La Manœuvre globale: Cadre général de la contre rebellion."

[54] Interview with Colonel Frédéric Garnier, October 2, 2013.

it can think in terms of going about an operation the best way. In contrast, he said, the French Army sees itself as having to make the best of whatever resources may be available. Thus, according to Garnier, planning for Serval was an exercise in thinking through what was and was not available and coming to terms with the associated risk. Goya carried the argument further and defined the American approach to warfare in terms of detecting the enemy, locating it, and then using firepower to destroy it. "Fire maneuver," he termed it. This compares with destroying the enemy through combat, or "combat maneuver," which is riskier. The French see fire maneuver as a luxury, something one can do when one has the means, but it is expensive. According to Goya, France's Ground Forces Command has gone so far as to express the desire that the French Army post-Afghanistan "de-Americanizes" so as not to retain the "bad habits" picked up fighting alongside the U.S. military. "We learned a lot of methods from the Americans," he said. But they do not want to retain the default to standoff fires and prefer to go back to "close combat." Another officer, a legionnaire who had participated in multiple African and Afghan deployments, similarly expressed concern that the French Army had learned some bad lessons in Afghanistan with regard to fighting "American-style warfare" in the sense that infantrymen worked in close conjunction with drones, satellites, and aircraft providing close air support. France could not afford to fight like that, he said, and besides, it was contrary to the experience of most French officers most of the time, who have to operate in the field with few resources.[55]

Of course, the French in Mali availed themselves of American support in the form of airlift, aerial refueling, and ISR, as the French Senate duly noted. The French did not draw on American resources in Mali to nearly the same extent as in Afghanistan, but that may have been because there was less American support in Mali to be had.[56] French pride notwithstanding, if it is true that the French are good at doing more with less, it is no less true that they would rather have more.[57]

Waging war on the cheap arguably translates into risk. As we have seen, the French in Mali operated at or beyond the limits of their sustainment capabilities. The fast pace of French operations meant that they frequently place relatively small contingents into harm's way. The airborne operation in Timbuktu apparently took place with little intelligence regarding the threat on the ground, given that the mission planners anticipated fighting some Islamists but found none.[58] The armored vehicles that the French used were almost entirely old models without the increased protection offered by newer vehicles or recent upgrades. For example, according to the French Senate, the VABs and VBCIs used in Mali were not equipped to counter IEDs, for the simple reason that those that were so equipped were all in Afghanistan.[59] Moreover, although VBCIs offer much better protection and other capabilities than any of the other

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55 Personal communication with a legionnaire, Carlisle, Pa., November 7, 2012.

56 Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 20.

57 One French officer who commanded units in Serval, when asked by the author what American resource he wished he had had in Mali, answered "CH-47s."

58 The last time that particular unit, the 2nd REP, did a combat jump was at Kolwezi, Zaire, in 1978. That was when 450 legionnaires jumped in daylight into a city held by hostile forces and took fire as they jumped. The legionnaires were outnumbered and outgunned and spent the day in firefights. Five were killed.

59 Chevènement et al., *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel,"* p. 20.

vehicles used in Mali, only 36 state-of-the-art VBCIs were used in Mali, compared with 177 venerable VABs (See Table 3.2). The presence of so many VABs relative to VBCIs itself represents a cost-risk assessment: The French in Serval relied on the VAB because that is what was on hand, not what they necessarily would have preferred; on the other hand, the presence of so many VABs in Africa reflects a bet that they are good enough for African contingencies, as well as the fact that France cannot afford to buy as many VBCIs as it would like or replace the VABs as quickly as it would like.[60] In addition, as stated earlier, French officers have disclosed that in Mali they were not capable of providing the golden hour standard of medical support called for by French doctrine for all of the operations going on at once and at times had to chose which operation would benefit.[61] Finally, close combat of the kind that the French have been boasting about is dangerous, and it is not clear what would have happened in Mali had French forces suffered significantly higher casualties than they did.

The "French way" articulated by the French officers interviewed by the author—each a *colonial* (i.e., a marine or a legionnaire)—reflects the kinds of overseas engagements in which the French Army has been active since decolonization and arguably long before. Its relevance for other kinds of missions, including other kinds for which the French Army trains and says it is prepared, is unclear. A more complete study of the French Army and its doctrines would examine France's historically nonexpeditionary forces—such as its two heavy *decision brigades*, which are supposed to retain the French Army's ability to fight peer threats—and documents related to how France might go about fighting a major conventional war. Some units from the ex-Continental force, such as the 92nd RI, served in Mali alongside the historically expeditionary units. It would be interesting to explore how they have changed in order to become expeditionary, as well as what differences might remain.

[60] The planned replacement for the VAB is the VBMR, which has not yet entered production.

[61] *Doctrine d'emploi des forces terrestres en zones desertique et semi-desertique (edition provisoire)*, p. 43; Roux, "RAND Corporation Conference."

CHAPTER FOUR

Conclusions

Operation Serval provides an example of how a technologically sophisticated army organizes and fields an expeditionary force that exhibits many of the traits outlined by General Raymond Odierno in his vision of the future force. As we have seen, the French Army in Mali operated using small, scalable, and task-organized combined arms forces (SGTIAs) and built them up or folded them into larger, scalable formations (GTIAs). These formed and re-formed on the fly as operational needs evolved. Moreover, the French organized themselves in this matter by doctrine and practice. They train to do this. They also located the smaller SGTIAs at the center of their operations, and placed the captains who command them, whom they train for the purpose and entrust with considerable autonomy, at the heart of the force. One French Army document that describes the SGTIA as the basic "pawn" of French ground forces also notes that warfare today, more than ever, is a "combat of captains."[1] Also, the French are investing in new technologies and vehicles (SCORPION) designed to facilitate mission command and coordination both among the different SGTIA and GTIA components and with joint partners. Lastly, the French operate de facto regionally aligned forces, which translates into regional expertise that they were able to leverage in Mali. They maintain their expertise through frequent rotations and forward deployments, many for long periods.

French requirements have also led them to adopt a force structure well suited for operations such as Serval. Namely, they use relatively lightly armored wheeled vehicles, which have smaller sustainment requirements compared with heavier, tracked vehicles. This was a good choice for Serval given that the French were operating at the extreme limit of their logistical capabilities. They also prefer mobility over protection, a choice that also reflects their cultural and doctrinal emphasis on maneuver. Intriguingly, although the French are moving forward with fleet modernization in tune with SCORPION, there is an undercurrent of resistance because of the perceived value of lower-technology vehicles, which reportedly are easier to sustain in the field than their newer replacements. It would be interesting to learn what the logistical burden of operating VBCIs in Mali was compared with the ancient VABs. The French in Mali were also able to validate the merits of their contingency "Guépard alert" system, as well as their fleet management system (PEGP), which successfully provided commanders with ready units and supplied those units with the vehicles they required, ostensibly at a lower cost than would have been the case prior to PEGP's introduction less than a decade ago. Finally, the French Army draws on an expeditionary culture, which reportedly makes coping with austerity a point of pride and also reinforces certain approaches toward operating among local populations.

[1] Hervé Charpentier, "Le combat des capitaines," *Doctrine Tactique*, no. 21, March 2011, pp. 4–5.

In sum, the French version of expeditionary warfare features the following characteristics:

- Modularity and scalability pushed down to the company task force (SGTIA)
- The ability to disaggregate and reaggregate battalions and brigades
- Combined arms and joint integration at the SGTIA level
- Battalion task forces rather than brigades as the basic operational unit
- Brigades that serve as force providers
- Decentralized operations
- An emphasis on mobility and firepower over protection and a reliance on light tanks
- Strong use of regional expertise and partnering with local forces
- A particular culture that, among other things, makes a virtue of roughing it and empowers risk taking
- Greater acceptance of risk.

The French way of war represented by Serval might not be optimal, particularly from the point of view of American commanders, who have far greater resources at their disposal. Among other things, those resources enable Americans to minimize risk in a manner that the French cannot. Serval, moreover, does not shed light on France's capacity to handle more-intense conventional conflicts or provide the conventional deterrent power that Odierno and French defense policy alike call for. Nor does it speak to France's ability to overcome the diverse challenges it now faces in Mali, although it does indicate that France at least is well aware of what it is facing, not to mention that it has a good handle on what it can and cannot expect from the Malians or the other African forces that have gathered in Mali and how to work with them. Finally, whereas the French appear confident that their success on the battlefield and low casualty rate demonstrate the proficiency of their military, one is reminded of Napoleon's alleged remark that the quality he looked for the most in his generals was that they be lucky. After all, given the risks the French ran—rushing cobbled-together units into combat, operating at the extreme edge of sustainment capabilities, conducting airborne operations, and cutting corners in a variety of ways—the casualty rate could easily have been much higher.

Although one can argue that Serval reflects the particularities of the French Army, Africa, and the French Army's long experience in Africa—and is thus of little relevance for other countries' militaries, least of all the vastly better-resourced U.S. Army—the aspects of French Army operations in Mali discussed here make the French Army a model for building the kind of expeditionary force envisioned by Odierno, and perhaps one that is also increasingly in line with future budgets. The degree to which the U.S. Army could or should emulate the French is, of course, debatable, and the answer might consist of "in some ways, in some cases, for some applications." Such a debate is timely, and this study has the potential to help make it an informed one.

References

Interviews

Interview with Colonel Frédéric Garnier, October 2, 2013, Paris, France.

Interview with Colonel Michel Goya, October 3, 2013, Paris, France.

French Army Briefings

"Briefing Land Forces May 2013." Land Forces Command, 2013.

Helluy, Bruno. "11th Parachute Brigade Presentation." PowerPoint, Ft. Bragg, June 23, 2013.

"Operation Serval." PowerPoint, Centre de doctrine d'emploi des forces/Division recherche et retour d'expérience, April 9, 2013.

Roux, Philippe. "RAND Corporation Conference: French Army Update Sahel Operation 'Serval' Lessons Identified." PowerPoint, RAND Corporation, Alexandria, Va., October 23, 2013.

French Government and Military Sources

Bodet, Jean-Luc. "Coup de pied dans la fourmilière." *Terre Info Magazine*, May 2013.

Bossion, Frank. "La formation des capitaines: Du cours des futurs commandants d'unité de cavalerie au commandement d'un sous-groupement tactique interarmes à dominante blindée." *Doctrine Tactique*, no. 21, March 2011, pp. 28–31.

Brunetaud, Céline. "La chaîne soutien en opérations: À coups d'expédition." *Terre Info Magazine*, May 2013.

Charpentier, Hervé. "Le combat des capitaines." *Doctrine Tactique*, no. 21, March 2011, pp. 4–5.

Chaumeil, Grégoire. "Logistique, l'autre combat." *Armées D'aujourd'hui*, May 2013.

Chevènement, Jean-Pierre, Gérard Larcher, Jacques Berthou, Alain Gournac, Joël Guerriau, and Rachel Mazuir. *Rapport d'information fait au nom de la commission des affaires étrangères, de la défense et des forces armées par le groupe de travail "Sahel."* Paris: Sénat, April 16, 2013. As of August 22, 2014: http://www.senat.fr/notice-rapport/2012/r12-513-notice.html

Doctrine d'emploi des forces terrestres en zones desertique et semi-desertique (edition provisoire). Centre de doctrine et d'emploi des forces, 2013.

De Préval, Lieutenant-Colonel. "Les principes de la formation du 'capitaine interarmes' à l'école d'infanterie." *Doctrine Tactique*, no. 21, March 2011, pp. 25–27.

Desportes, Vincent. "Forces terrestres et nouvelle conflictualité." *Doctrine: Revue D'études Générales*, no. 13, 2007, pp. 4–6.

"Equipements: Vehicles." Ministère de la défense, July 31, 2013. As of August 26, 2014: http://www.defense.gouv.fr/terre/equipements/vehicules

Hocquard, Patrick. "L'action de la division maintenance du commandement des forces terriestres (CFT)." *Héraclès*, no. 43, June 2011, p. 11.

"Le Dixmude achemine une importante force blindée au Mali." *Mer et Marine: Tout l'Actualité Maritime*, January 23, 2013. As of August 22, 2014: http://www.meretmarine.com/fr/content/le-dixmude-achemine-une-importante-force-blindee-au-mali

"L'engagement des forces prépositionnées en Afrique: D'Abidjan à Tombouctou et Gao: Le raid blindé du 4e escadron du 1er RHP." *Béret Rouge: Le Magazine des Parachutistes*, May 2013.

"L'entraînement au combat interarmes." *Terre Information Magazine*, November 2010.

Le livre blanc sur la défense et la sécurité nationale. Paris: Direction de l'information légale et administrative, 2013.

"Le maillon fort." *Terre Information Magazine*, June 2010.

"Le programme Scorpion." Ministère de la défense, June 6, 2012. As of August 22, 2014: http://www.defense.gouv.fr/dga/equipement/terrestre/le-programme-scorpion

"Les enseignements tirés des engagements des SGTIA en OPEX." *Doctrine Tactique*, no. 21, March 2011, pp. 19–20.

"Les principles d'entraînement des sous-groupements interarmes (SGTIA) au CENTAC." *Doctrine Tactique*, March 2011.

Manuel d'emploi du groupement tactique interarmes à dominante infanterie. Armée de terre, 2001.

Manuel du sous-groupement tactique interarmes. Centre de doctrine d'emploi des forces, 2009.

Opération Serval: Le retour de la manœuvre aéroterrestre dans la profondeur. Réflexions Tactiques, Numéro Spécial. Paris: Armée de terre, Centre de doctrine d'emploi des forces, 2014.

"Opération Serval: Point de situation du 22 janvier 2013." Ministère de la défense, January 22, 2013. As of August 26, 2014: http://www.defense.gouv.fr/operations/actualites/operation-serval-point-de-situation-du-22-janvier-2013

"Operation Serval: Zoom sur le détachement Harfang." Ministère de la défense, August 2, 2013. As of August 29, 2014: http://www.defense.gouv.fr/operations/barkhane/archives-serval/actualite/operation-serval-zoom-sur-le-detachement-harfang

"Par les airs et par la piste," *Béret Rouge: Le Magazine des Parachutistes*, May 2013.

Perche, Nicolas. "SCORPION Program." Direction générale de l'armement, Ministère de la défense, 2011.

"Serval: Point de situation hebdomadaire du 11 octobre 2013." Ministère de la défense, October 11, 2013. As of August 26, 2014: http://www.defense.gouv.fr/operations/actualites/serval-point-de-situation-hebdomadaire-du-11-octobre-2013

"Serval: Relève de la 3e brigade mécanisée par la 6e brigade légère blindée." Ministère de la défense, May 13, 2013. As of August 25, 2014: http://www.defense.gouv.fr/operations/actualites/serval-releve-de-la-3e-brigade-mecanisee-par-la-6e-brigade-legere-blindee

"Serval: Rétablissement de la zone aéroportuaire de Tombouctou et de Tessalit." *Béret Rouge: Le Magazine des Parachutistes*, May 2013.

"Tout savoir sur la PEGP." *Armée de terre*, July 27, 2012. As of August 22, 2014: http://www.defense.gouv.fr/terre/mediatheque/documents-interactifs/tout-savoir-sur-la-pegp

Villanueva, François. "L'intégration des appuis au niveau du SGTIA." *Doctrine Tactique*, no. 21, March 2011, pp. 15–18.

Other Secondary Sources

4ème recensement general de la population et de l'habitat du Mali (RGPH), Republique du Mali, Ministère de l'economie et des finances, Institut national de la statistique, and Bureau central du recensement, November 2011. As of August 29, 2014:
http://instat.gov.ml/documentation/Tableaux_Demographiques_VF.pdf

"Actualité," Ministère de la défense, various dates. As of September 10, 2014:
http://www.defense.gouv.fr/operations/barkhane/archives-serval/actualite

Ahmed, Baba. "Mali: Comment Ag Gamou a échappé au MNLA et à Ansar Eddine." *JeuneAfrique.com*, April 11, 2012. As of August 22, 2014:
http://www.jeuneafrique.com/Article/ARTJAWEB20120411092856/

Bernus, Edmund, Pierre Boilley, and Jean Clauzel. *Nomades et commandants: Administration et sociétés nomades dans l'ancienne A.O.F.* Paris: Karthala, 1993.

Boilley, Pierre. *Les Touaregs Kel Adagh: Dépendances et révoltes—du Soudan français au Mali contemporain*. Paris: Karthala, 1999.

Callimachi, Rukmini. "Mali Manual Suggests Al-Qaida Has Feared Weapon." Associated Press, June 11, 2013. As of August 22, 2014:
http://news.yahoo.com/mali-manual-suggests-al-qaida-feared-weapon-145958976.html

Carayol, Rémi. "Mali: Gamou, La revanche dans la peau." *JeuneAfrique.com*, March 4, 2013. As of August 22, 2014:
http://www.jeuneafrique.com/Article/JA2720p030-033.xml0/

Chapleau, Philippe. "Rusticité et ingéniosité: Malgré tout, les véhicules tirent la langue au Mali." *Lignes de Défense*, March 30, 2013. As of August 22, 2014:
http://lignesdedefense.blogs.ouest-france.fr/archive/2013/03/29/rusticite-et-ingeniosite-les-vehicules-tirent-la-langue-et-r.html

Clauzel, J. "Évolution de la vie économique et des structures sociales du pays nomade du Malil: De la conquête française à l'autonomie interne (1893–1958)." *Tiers-Monde*, vol. 3, nos. 9–10, 1962, pp. 283–311.

"D'Abidjan à Tessalit, le SEA au cœur du dispositif Serval." Ministère de la défense, July 16, 2013. As of August 29, 2014:
http://www.defense.gouv.fr/essences/article-a-la-une/d-abidjan-a-tessalit-le-sea-au-caeur-du-dispositif-serval

"Des armes lourdes récupérées par Aqmi en Libye." *Rfi.fr*, March 28, 2011. As of August 22, 2014:
http://www.rfi.fr/afrique/20110327-armes-lourdes-recuperees-aqmi-libye

"Des avions français bombardent le Mouvement arabe de l'Azawad." *LeMonde.fr*, May 20, 2013. As of February 11, 2014:
http://www.lemonde.fr/afrique/article/2013/02/25/des-avions-francais-bombardent-le-mouvement-arabe-de-l-azawad_1838322_3212.html

Desportes, Vincent. *La guerre probable*. 2nd ed. Paris: Economica, 2008.

"First A400M Operational Mission Flown into Africa." *DefenceWeb*, January 9, 2014. As of August 22, 2014:
http://www.defenceweb.co.za/index.php?option=com_content&view=article&id=33162&catid=74&Itemid=30

Goya, Michel. "Dix millions de dollars le milicien: La crise du modèle occidental de guerre limitée de haute technologie." *Politique Étrangère*, no. 1, 2007, pp. 191–202.

Grémont, Charles. *Tuaregs et Arabes dans les forces armées coloniales et maliennes: Une histoire en trompe-l'œil*. Note de l'Ifri. Paris: Ifri, 2010.

Hall, Bruce S. *A History of Race in Muslim West Africa, 1600–1960*. Cambridge, UK: Cambridge University Press, 2011.

Hinshaw, Drew. "French Seek to Prevent Rebel Revival in Mali." *The Wall Street Journal*, September 10, 2013. As of August 22, 2014:
http://online.wsj.com/article/SB10001424127887323455104579016550368067092.html

Irondelle, Bastien. *La réforme des armées en France*. Paris: SciencesPo. Les Presses, 2011.

"Kidal: La présence supposée d'éléments du colonel Gamou rend encore plus difficile encore le retour de l'armée." *Rfi.fr*, July 7, 2013. As of August 22, 2014:
http://www.rfi.fr/afrique/20130707-mali-kidal-presence-supposee-elements-colonel-gamou-difficile-retour-armee

Lagneau, Laurent. "Retour sur les combats d'Imènas, près de Gao." *Zone Militaire*, March 28, 2013. As of August 25, 2014:
http://www.opex360.com/2013/03/28/retour-sur-les-combats-dimenas-pres-de-gao/

Lecocq, Jean Sebastien. "That Desert Is Our Country: Tuareg Rebellions and Competing Nationalisms in Contemporary Mali (1946–1996)." Academisch Proefschrift, Universiteit von Amsterdam, 2002.

"Les Touaregs Du Col. Ag Gamou et L'armée Française Aux Portes de Tessalit." Video, posted by ImazighenLibya, February 9, 2013. As of August 22, 2014:
http://www.youtube.com/watch?v=AM0xfEP7oW8&feature=youtube_gdata_player

Lottier, Jean-Paul. "200 légionnaires du 2e REP de Calvi au Mali." *Corse Net Infos*, January 27, 2013. As of August 22, 2014:
http://www.corsenetinfos.fr/200-legionnaires-du-2e-REP-de-Calvi-au-Mali_a1603.html

Lum, Khalid. "RE: Canard Enchaîné, Qatar in Northern Mali and Algeria." *The Moor Next Door*, June 10, 2012. As of August 22, 2014:
http://themoornextdoor.wordpress.com/2012/06/10/re-canard-enchaine-qatar-in-northern-mali-and-algeria/

"Mali: Découverte d'armes lourdes dans l'Adrar des Ifoghas (Photos)." *Noorinfo.com*, March 4, 2013. As of August 22, 2014:
http://www.noorinfo.com/Mali-decouverte-d-armes-lourdes-dans-l-Adrar-des-Ifoghas-Photos_a8005.html

"Mali: Le colonel Michel Goya décrypte la stratégie de la France." Video, posted by TV5MONDE, January 15, 2013. As of August 22, 2014:
http://www.youtube.com/watch?v=haqGmY2S2Wc&feature=youtube_gdata_player

Merchet, Jean-Dominique. "Général Barrera: 'Mes ordres étaient clairs: Détruisez les djihadistes!'" *L'Opinion*, July 13, 2013.

———. "Nord-Mali: L'opération Panthère se solde par une victoire dans l'Ametettaï (actualisé)." *Secret Défense*, March 5, 2013. As of June 12, 2013:
http://www.marianne.net/blogsecretdefense/Nord-Mali-l-operation-Panthere-se-solde-par-une-victoire-dans-l-Ametettai-actualise_a972.html

Monin, Etienne. "Les derniers jours de la guerre dans l'Adrar au Mali—France Info." *France Info*, March 25, 2013. As of June 20, 2013:
http://www.franceinfo.fr/monde/le-plus-france-info/
les-derniers-jours-de-la-guerre-dans-l-adrar-au-mali-930107-2013-03-25

Oberlé, Thierry. "'AQMI épaule les rebelles touaregs': Interview: Amadou Toumani Touré, le président malien, s'exprime pour la première fois dans un média étranger depuis le début de la rébellion touarègue." *LeFigaro.fr*, March 14, 2012. As of August 22, 2014:
http://www.lefigaro.fr/international/2012/03/14/01003-20120314ARTFIG00773-att-aqmi-epaule-les-rebelles-touaregs.php

Odierno, Raymond. "General Odierno Speech at AUSA Annual Conference, October 2012." Association of the United States Army Annual Meeting, October 23, 2012.

———. "The Force of Tomorrow." *Foreign Policy*, February 4, 2013. As of August 29, 2014:
http://www.foreignpolicy.com/articles/2013/02/04/the_force_of_tomorrow

"Opération Serval—14 janvier 2013: Chargement des véhicules dans Antonov pour le Mali." Video, posted by FORCESFRANCAISES, January 7, 2013. As of August 26, 2014:
http://www.youtube.com/watch?v=DE_62fFZy-g

"Opération Serval—Abidjan le 24 janvier 2013: Préparation du GTIA aéroporté." Video, posted by FORCESFRANCAISES, January 19, 2013. As of August 22, 2014:
https://www.youtube.com/watch?v=BBEBBrFXY4k

Opération Serval au Mali: Embarquement des blindés du 92e RI à bord du BPC Dixmude. Marine Nationale, January 22, 2012. As of August 22, 2014:
http://www.theatrum-belli.com/archive/2013/01/22/operation-serval-au-mali-embarquement-des-blindes-du-92e-ri.html

Pernin, Christopher G., Edward Wu, Aaron L. Martin, Gregory Midgette, and Brendan See, *Efficiencies from Applying a Rotational Equipping Strategy*, Santa Monica, Calif.: RAND Corporation, MG-1092-A, 2011. As of August 27, 2014:
http://www.rand.org/pubs/monographs/MG1092.html

Pezard, Stephanie, and Michael Shurkin. *Toward a Secure and Stable Northern Mali: Approaches to Engaging Local Actors*. Santa Monica, Calif.: RAND Corporation, RR-296-OSD, 2013. As of August 22, 2014:
http://www.rand.org/pubs/research_reports/RR296.html

Porch, Douglas. *The Conquest of the Sahara*. New York: Farrar, Straus and Giroux, 2005.

Rémy, Jean-Philippe. "Mali: Dans la vallée d'Amettetaï, l'appui crucial des Tchadiens." *LeMonde.fr*, March 7, 2013. As of February 28, 2014:
http://www.lemonde.fr/afrique/article/2013/03/07/mali-dans-la-vallee-d-amettetai-l-appui-crucial-des-tchadiens_1844234_3212.html

Rosso, Romain. "Mali: Comment les forces spéciales ont repris Tessalit en quelques heures." *L'Express*, February 21, 2013. As of August 22, 2014:
http://www.lexpress.fr/actualite/monde/afrique/mali-comment-les-forces-speciales-ont-repris-tessalit-en-quelques-heures_1222356.html

Saint Quentin, Grégoire de. "Premières leçons opératives de l'opération Serval (janvier–juin 2013)." *Revue Défense Nationale*, no. 763, October 2013.

"Scorpion Exites French Combat Vehicle Industries." *Defense Update*, n.d. As of August 22, 2014:
http://defense-update.com/features/2010/july/scorpion_vehicles_eurosatory_02072010.html

Tramond, Olivier, and Philippe Seigneur. "Early Lessons from France's Operation Serval in Mali." *Army Magazine*, June 2013.